UNIVERSITY OF CAMBRIDGE

CAMBRIDGE SCIENCE FESTIVAL

Mon 11 Mar –
Sun 24 Mar 2019

To pre-book, visit:
www.sciencefestival.cam.ac.uk
or call: 01223 766766

There is no need to pre-book events unless specifically stated in the programme

Bookings open:
Mon 11 Feb 2019

Lines open:
11AM – 3PM
Mon – Fri

Useful information
Please contact us if you would like all or part of this publication in large font. An audio programme is available on request.

- → Children under the age of 16 must be accompanied by an adult at all times.
- → You may be refused entry if you arrive after an event has started even if you have booked.
- → Limited tickets will be available on the door for all pre-book events.

Your attendance at the Festival signifies your agreement to comply with the Guidance for Attending Cambridge Science Festival:
www.sciencefestival.cam.ac.uk/attending

The University of Cambridge and our sponsors and partners are proud to present the Cambridge Science Festival:

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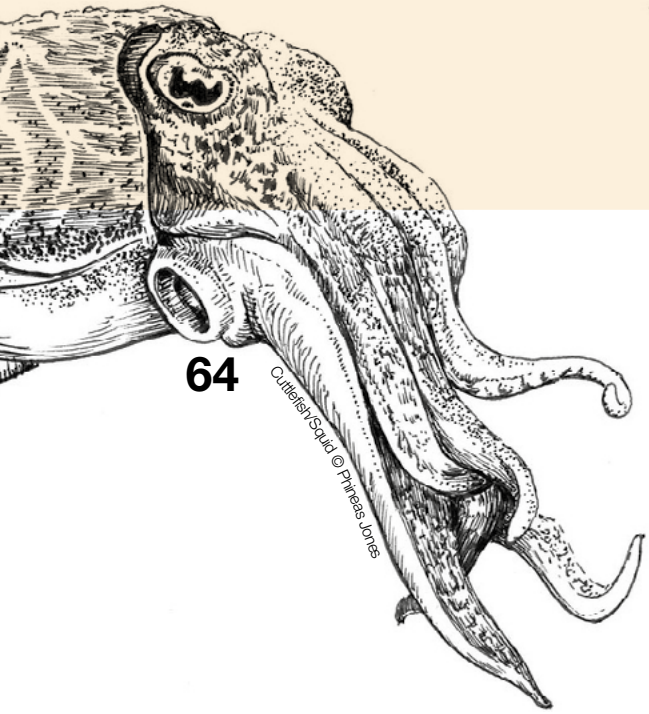
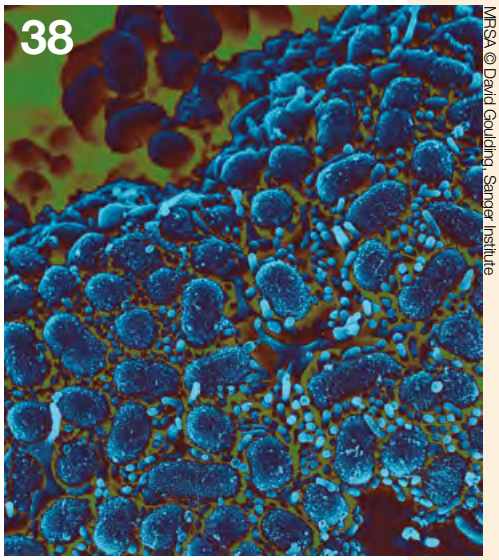
Welcome to the 2019 Cambridge Science Festival

Explore this year's theme of Discovery



Cuttlefish/Squid © Phineas Jones

Moon © Wikipedia, Gregory H. Revera



MRSA © David Goulding, Sanger Institute

Millet © Toby Smith Shoot Unit

It's a year of celebrations! 2019 marks the 200th anniversary of Cambridge Philosophical Society, Cambridge's oldest scientific society. It's 150 years since the publication of the modern Periodic Table and Cambridge Science Festival is 25! Join us to discover more about the history of science in Cambridge, how current research is improving our understanding of the world and what the future might hold for us all.

Please tell us what you think of the Festival

sciencefestival.cam.ac.uk/feedback

Key

- Pre-book this event (events are free unless a price is indicated)
- Exhibitions and displays
- Talks and debates
- Performance, comedy, theatre and music
- Films
- Hands-on events and workshops
- Tours

Accessibility

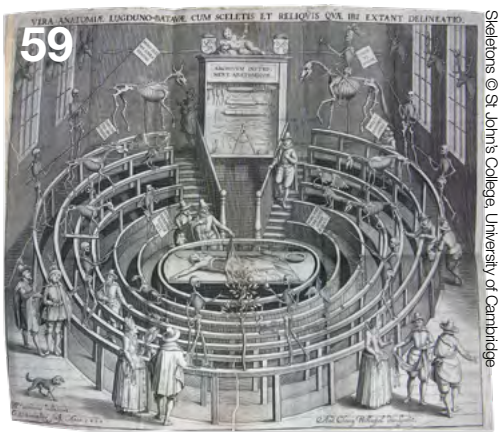
The Science Festival takes place over many different venues with differing levels of accessibility. Everyone is welcome at the Festival and if you require specific access arrangements, please call: 01223 766766 or email: csf@admin.cam.ac.uk

T	Toilet, wheelchair accessible
S	Step free
Li	Lift to all floors
PA	Partial access: phone or email to discuss your requirements

The University of Cambridge Disability Access Guide is available at: www.cam.ac.uk/disability

cambridgesciencefestival
camscience | #csf2019

Antarctic © Scott Polar Research Institute



Skeletons © St John's College, University of Cambridge

Throughout the Festival

There is no need to **pre-book** events unless indicated by our booking icon

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www.sciencefestival.cam.ac.uk
or call: 01223 766766

DISCOVERY: SEEDING CAMBRIDGE SCIENCE, 200 YEARS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY
The Cambridge Philosophical Society has spent 200 years providing a forum in which innovative research could take place, be discussed and be communicated. This exhibition showcases that history, and how the Society today nurtures the scientists of the future.

9AM – 6PM
→ **WEEKDAYS FROM FRI 8 MAR**
9AM – 4.30PM
→ **SAT 16 MAR**
SAT 23 MAR
NOT OPEN SUNDAYS
Milstein Exhibition Centre,
Cambridge University Library,
West Road, CB3 9DR

A DAY IN THE LIFE OF THE IHAT-GUT CLINICAL TRIAL
This unique photography exhibition offers glimpses of the everyday life of the staff and communities during an award-winning iron supplementation paediatric trial in rural Gambia developed by Dr Dora Pereira. Photos by Isabella Stelle.

NORMAL CAFE OPENING HOURS
→ **MON 11 MAR TO SUN 24 MAR**
The Locker Cafe,
54 King Street, CB1 1LN

GROUND ZERO EARTH
Celebrating the work of the Centre for the Study of Existential Risk, this exhibition, curated by Yasmin Rix, brings together five artists exploring anthropogenic themes to address what is at stake and how we should be looking at the present and near future.

9AM – 5PM
→ **MON 11 MAR TO FRI 22 MAR WEEKDAYS ONLY**
Alison Richard Building, Sidgwick Site, 7 West Road, CB3 9DT

THE COLOURFUL WORLD OF WOOD ANATOMY
A display of gorgeous colour photographs of wood anatomy. This exhibition is a lush journey into the extraordinary microanatomy of vascular plants from all over the world.

10AM – 4PM
→ **MON 11 MAR TO FRI 22 MAR WEEKDAYS ONLY**
Department of Geography, Downing Place, CB2 3EN

THE AGE OF REASON, RELIGION AND RIDICULE IN THE LIBRARY OF THE REVD DAVID HUGHES (C.1704–77)
Featuring astronomical, religious and profane imagery in the pamphlet collection of Queens' Fellow David Hughes (1704–77), this exhibition juxtaposes the big Newtonian questions of man, society and creation as posed in 18th century Cambridge with their portrayal in scurrilous satire of the period.

1.30PM – 4.30PM
→ **MON 11 MAR TO FRI 22 MAR WEEKDAYS ONLY**
Old Library, Queens' College, Silver Street, CB3 9ET

HANDS-ON SCIENCE AT CAMBRIDGE SCIENCE CENTRE
Cambridge Science Centre goes all out for the Cambridge Science Festival, with fun-filled, hands-on workshops for all the family. Join us for a day of creative thinking and make some inspiring, scientific and engineering memories along the way.

NORMAL OPENING HOURS
→ **TUE 12 MAR TO SUN 24 MAR**
Cambridge Science Centre, Unit 44, Clifton Road Industrial Estate, CB1 7EP

Normal admission charge

INTERNATIONAL YEAR OF THE PERIODIC TABLE EXHIBITION
2019 is the 150th anniversary of Dmitri Mendeleev's periodic system of the elements. St Catharine's College is proud to host an exhibition that includes Mendeleev's very first published table, as well as versions from other scientists who independently devised their own systems around the same time.

9AM – 5PM
→ **TUE 12 MAR TO FRI 5 APR WEEKDAYS ONLY**
Ramsden Room, St Catharine's College, Trumpington Street, CB2 1RL

PLANTS AND CHEMICALS EXPLORATION TRAIL
2019 is the International Year of the Periodic Table, marking the 150th anniversary of its creation by Dmitri Mendeleev. The Botanic Garden's new adult trail celebrates this milestone, highlighting plants that have unique adaptations for extracting and storing chemical elements.

10AM – 5PM
→ **FRI 15 MAR TO SUN 24 MAR**
Botanic Garden, 1 Brookside, CB2 1JE

Normal admission charge

Week one

Feature Image
A day in the life of the IHAT-GUT clinical trial
Credit: Isabella Stelle

Pre-Festival

SHOULD PARENTS HAVE THE FINAL SAY ON THEIR CHILD'S MEDICAL TREATMENT?

The Baron De Lancey Lecture

If doctors believe that they might be able to save a dying child, should the parents have the freedom to pursue this treatment? If a court decides that the treatment is not in the child's best interests, should it have unlimited authority to intervene? When deciding what care a child receives, should the wishes of the parents be given any weight? Dr Imogen Goold, University of Oxford, explores the scope of parental and judicial power.

5.30PM – 7PM

→ **FRI 8 MAR**

Faculty of Law, Sidgwick Site, 10 West Road, CB3 9DZ

DISCOVERY IN CONCERT

Join the Cambridge Graduate Orchestra on International Women's Day to celebrate discoveries in science and music. The performance starts with a pre-concert talk by Dr Jess Wade, Imperial College London, and advocate for women in STEM, followed by a new composition by our Composer in Association, Strauss Horn Concerto No. 2, with soloist Annemarie Federle, and Dvorak's Symphony No. 9 *From the New World*.

7.30PM – 9.30PM

→ **FRI 8 MAR**

West Road Concert Hall, 11 West Road, CB3 9DP

£15 / £10 / £7

Mon 11 Mar

LITTLE EXPLORERS: ICE AND ANTI-FREEZE

Join us at the Polar Museum for a chillsome story of ice and anti-freeze in this sensory story session for the under 5s with storyteller Marion Leeper. Includes an icy experiment in each session too!

10AM – 11AM
11.15AM – 12.15PM

→ **MON 11 MAR**

Scott Polar Research Institute, The Polar Museum, Lensfield Road, CB2 1ER

For children under five and their parent or carer

WHISTLER, NATURE AND SCIENCE: A STUDY DAY

James McNeill Whistler is one of the world's best-known 19th century artists. Less well known is the interaction of nature and science in his work and thought. This study day begins with a guided tour around the exhibition *Whistler & Nature* by art historian Dr Patricia de Montfort, Glasgow University, and includes illustrated talks by experts.

10.30AM – 4.30PM

→ **MON 11 MAR**

Fitzwilliam Museum, Trumpington Street, CB2 1RB

For adults only

Includes refreshments and lunch

£12.50

THE COLOURFUL WORLD OF WOOD ANATOMY
This exhibition is a lush journey into the extraordinary microanatomy of vascular plants from all over the world. This welcoming talk provides behind-the-scenes stories and descriptions of each photo, to deepen and enhance the viewer's experience.

12.30PM – 1PM
→ **MON 11 MAR**
MON 18 MAR
Department of Geography, Downing Place, CB2 3EN

DISCOVERY?
Were America, Africa, Asia or Oceania 'discovered'? Is it possible to discover a region that was already inhabited? What can different sciences tell us about these discoveries and their local and global implications? Led by Dr Beatriz Marín-Aguilera, this interdisciplinary discussion digs deeper.

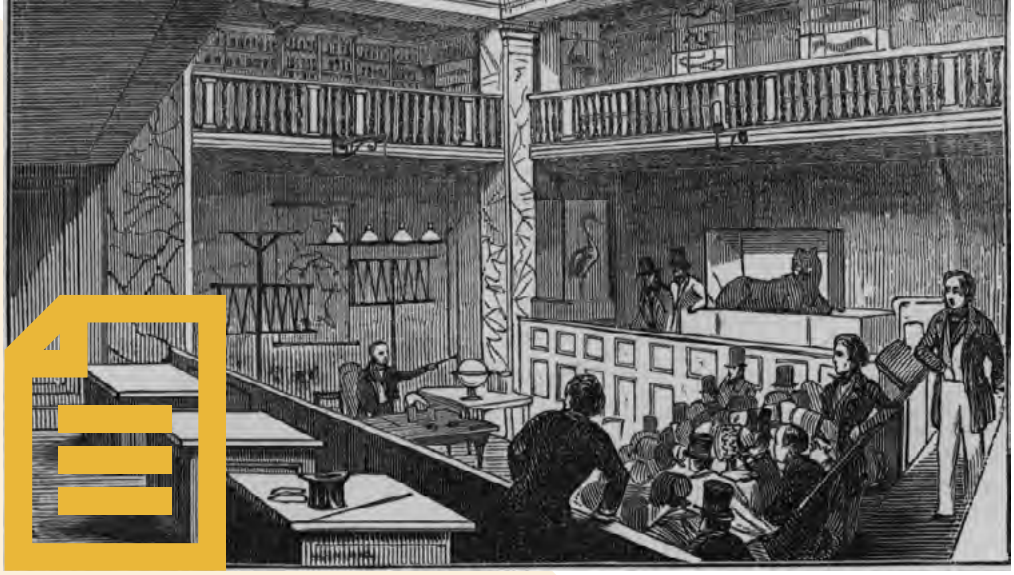
4.30PM – 6.30PM
→ **MON 11 MAR**
Henry Wellcome Building, Fitzwilliam Street, CB2 1QH

NEWCOMERS IN THE TABLE OF CHEMICAL ELEMENTS
The recently discovered super-heavy elements with atomic numbers 114–118 completed the seventh row of the Periodic Table of Dmitri Mendeleev. Professor Yuri Oganessian, after whom the very last of these elements was named, discusses how these new elements were synthesised in the laboratory, and what he and his colleagues saw during their discovery.

5PM – 6PM
→ **MON 11 MAR**
McGrath Centre, St Catharine's College, Trumpington Street, CB1 2RL

AN INTRODUCTION TO TREE-RING RESEARCH
The Department of Geography presents a brief history of the science of dendrochronology and introduces how tree rings are used to investigate past climate and environmental variability several centuries-to-millennia back in time. Visitors are then invited to tour the labs to discover more about tree rings, wood anatomical measurements and dendrochronological dating techniques. Different types of wood from around the world will be on display for visitors to handle, examine through microscopes, and view in projected images.

6PM – 7PM
→ **MON 11 MAR**
THU 14 MAR
MON 18 MAR
THU 21 MAR
Department of Geography, Downing Place, CB2 3EN



CAMBRIDGE PHILOSOPHICAL SOCIETY

"...to keep alive the spirit of inquiry..."
A brief history of Cambridge's oldest scientific society

In 1819, the Cambridge Philosophical Society was founded by Adam Sedgwick and John Stevens Henslow. Though Regency Cambridge had several professors in scientific subjects, few undergraduates attended their lectures, the University did not offer science degrees, and there was little encouragement or funding for original research. Sedgwick and Henslow envisaged a Society, independent of the University, which would facilitate cooperation between scientific thinkers, create a forum for the public communication of results, inspire investigations in new fields, form links to other scientific bodies around the country, and preserve the research of the Society's fellows in print.

Within a year of its foundation, the Society had instituted fortnightly meetings, had set up Cambridge's most extensive scientific library, had collected and curated Cambridge's first museum of natural history, and had begun publishing Cambridge's first scientific periodical. Emboldened by this early success, the Society began to push for reform of scientific teaching and research in the University and Colleges: fellows of the Society were involved in the creation of science degrees, the building of University and College laboratories, and campaigning for increased funding and career opportunities for scientists.

Throughout the nineteenth and twentieth centuries, the Society played a key role in raising the profile of the sciences in Cambridge. Many facilities grew out of different elements of the Society: the Society's library became the University's Central Science Library; its museum became the core of the University's Zoology Museum.

Today, the Society funds post-doctoral Henslow Fellowships and supports doctoral students through a grant programme, and still provides important spaces for scientific communication: its fortnightly meetings have taken place uninterrupted since 1819; and it continues to publish two world-class journals – *Biological Reviews and Mathematical Proceedings.*

DR SUSANNAH GIBSON
Affiliated Scholar, Department of History and Philosophy of Science

PROFESSOR JIM WOODHOUSE
Department of Engineering,
Vice-President Cambridge Philosophical Society

RELATED EVENTS:
DISCOVERY: SEEDING CAMBRIDGE SCIENCE, 200 YEARS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY **P04**

THE CAMBRIDGE PHILOSOPHICAL SOCIETY AND THE INVENTION OF SCIENCE, 1819–2019 **P10**

ORIGIN STORY: A MUSEUM OF ZOOLOGY LATE **P58**

THE CAMBRIDGE PHILOSOPHICAL SOCIETY AND THE INVENTION OF SCIENCE, 1819–2019

Today, Cambridge is recognised as a world-leading centre for science, but it wasn't always so.
Dr Susannah Gibson discusses how science in Cambridge developed thanks to the work of the Cambridge Philosophical Society, and tells of the ground-breaking research presented at its meetings over the last 200 years, from Charles Darwin's *Beagle* letters to Lawrence Bragg's X-ray crystallography.

6PM – 7PM
→ **MON 11 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

PINTS AND PUZZLES

Enjoy a pub quiz without the annoying competitive aspect. Solve puzzles rather than answer general-knowledge questions – use problem-solving skills instead of fact-hoarding. Join puzzle-mad mathematicians Dr Katie Steckles and Ben Sparks for a brain-teasing selection of mathematical puzzles, with plenty of hints and clues if you get stuck and some surprising answers along the way.

7PM – 9PM
→ **MON 11 MAR**
Thirsty Cambridge,
46 Chesterton Road,
CB4 1EN
For adults only

IS TECHNOLOGY MAKING US MISERABLE?

Technology is interwoven and invisible in our lives. Virtually every interaction we have is mediated through technology. Despite being 'always-on', are we any better off? Are we better connected? Or is technology making us miserable? If it is, what would the evidence be? And would we heed it? With Jesus College Intellectual Forum.

7.30PM – 9PM
→ **MON 11 MAR**
West Court, Jesus College,
Jesus Lane, CB5 8BL

SCIENCE IN THE SPOTLIGHT

Presented in partnership with Science AAAS

Most of us find out about scientific advances and their consequences through the media. Who decides what science we see, and how can we promote informed debate in public and in government? Are scientific controversies the result of poor reporting or are scientists also responsible? Chaired by Tim Radford with Fiona Fox, Science Media Centre, Rebecca Asher, Sense about Science, Dr Chandrika Nath, Dr Julian Huppert and Dr Jane Gregory.

7.30PM – 9PM
→ **MON 11 MAR**
McGrath Centre,
St Catharine's College,
Trumpington Street, CB1 2RL

SCIENCE FESTIVAL CEILIDH

Put on your dancing shoes and join the Red Rock Ceilidh Band to celebrate the start of the Science Festival! Featuring Festival favourite dances, The Very Large Hadron Collider and Mr Schrödinger's Maggot.

7.30PM – 9.30PM
→ **MON 11 MAR**
Emmanuel United Reformed Church, 72 Trumpington Street, CB2 1RR

£7 / £4 / free

WHAT DOES IT MEAN TO BE HUMAN? SOME REFLECTIONS ON ADVANCES IN ARTIFICIAL INTELLIGENCE AND ROBOTICS

Professor John Wyatt, University College London and the Faraday Institute, investigates the implications for human self-understanding of recent advances in artificial intelligence and robotic technology. As part of this Science Meets Faith talk at Wesley Methodist Church, he discusses biomedical ethics and the wider implications of technological advances.

7.45PM – 9PM
→ **MON 11 MAR**
Wesley Methodist Church,
Christ's Pieces, CB1 1LG

Tue 12 Mar

SCIENCE ARCHIVES AND SPECIAL COLLECTIONS IN CAMBRIDGE

Cambridge has a wealth of sources for those interested in the history of science. Find out about the science archives and special collections across Cambridge, and how to access them. Discover more about the records that scientists leave behind, what they tell us about their work and life, and how they can be used for historical research.

1PM – 5PM
→ TUE 12 MAR
Jock Colville Hall, Churchill College, Storey's Way, CB3 0DS

DISCOVERIES THAT ENABLED THE MODERN WORLD

You can discover so many things in unexpected places: there is so much to find out and wonder at in all sorts of everyday situations. Take part in science experiments and a talk at Cambridge Regional College based around important discoveries.

5PM – 8PM
→ TUE 12 MAR
Cambridge Regional College, King's Hedges Road, CB4 2QT
Great for families

2019 ANNUAL WISETI LECTURE: THE ADOLESCENT BRAIN

Remember being a teenager? Rocked internally with hormones and outwardly with social pressures, you sometimes wondered what was going on in your head. So does Professor Sarah-Jayne Blakemore, University College London. Her research concentrates on the development of social cognition and decision making in the adolescent brain, and is the focus of this year's WiSETI Lecture.

5.30PM – 6.30PM
→ TUE 12 MAR
Wolfson Hall, Churchill College, Storey's Way, CB3 0DS

I'M A CONFUSED CONSUMER, GET ME OUT OF HERE!

Cambridge Global Food Security IRC Public Talk

Join us to discuss consumer behaviour, what food manufacturers and retailers are doing to catch our attention and how we can help each other to make the right food choices.

5.30PM – 7PM
→ TUE 12 MAR
Department of Plant Sciences, Downing Site, CB2 3EA

GIRTON 150 FOUNDERS' SCIENCE LECTURE: ATOMS IN ACTION

Dame Professor Pratibha Gai is one of Britain's best-known physicists and the first to create a microscope capable of perceiving chemical reactions at the atomic scale. Reflecting something of her Girton heritage, she has not patented that machine to ensure its scientific potential is realised to the full. She presents the Founders' Science Lecture as part of Girton College's 150th anniversary.

5.45PM – 7PM
→ TUE 12 MAR
Stanley Library, Girton College, Huntingdon Road, CB3 0JG

CORAL REEFS, MALARIA AND DRUG DISCOVERY

Cambridge Infectious Diseases Public Lecture

Dr Ellen Nisbet discusses how saving the world's coral reefs is helping to cure malaria. Corals contain photosynthetic algae, and die when the algae are lost. And malaria parasites are really algae in disguise.

6PM – 7PM
→ TUE 12 MAR
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

THE PERIODIC TABLE

DR PETER WOTHERS
Department of Chemistry

Director of Studies in Chemistry,
St Catharine's College

The United Nations have proclaimed 2019 to be the International Year of the Periodic Table of Chemical Elements since it is the 150th anniversary of the publication of Dmitri Mendeleev's first Periodic Table. But was it really the first? St Catharine's College is proud to exhibit its fine collection of material relating to the early development of the Periodic Table. Starting from the first list of elements which emerged around the time of the French Revolution in the late 1780s, and the first list of atomic masses drawn up by Manchester chemist John Dalton, we explore why six different chemists from around the world each came up with their own versions of the iconic table in the 1860s.

The very first person to arrange all the then-known elements by mass and then look for the repeating properties of related elements was the French mineralogist Alexandre-Émile Béguyer de Chancourtois in 1862. Béguyer plotted his elements around a cylinder or helix with a circumference of sixteen atomic mass units and found elements with similar properties aligned in vertical groups down the cylinder. This coloured chart, over 1.5 metres in length, was published in very limited numbers and is now incredibly rare.

In addition to Mendeleev's first published versions of his table, including one signed by the great chemist himself, earlier forms created by two British chemists are also featured. Two new works of art specially created to mark this important anniversary will also be on display. One is a spiral made from precious metal, the other is a macramé version containing more than 180,000 knots.

RELATED EVENTS

INTERNATIONAL YEAR OF THE PERIODIC TABLE EXHIBITION **P05**
NEWCOMERS IN THE TABLE OF CHEMICAL ELEMENTS **P08**
TABLE TALK: A LECTURE CELEBRATING THE 150TH ANNIVERSARY OF MENDELEEV'S PERIODIC TABLE **P31**
PLANTS AND CHEMICALS EXPLORATION TRAIL **P05**
MENDELEEV'S DREAM: EXPERIENCE THE PERIODIC TABLE THROUGH MUSIC! **P54**

MEASURING NATURE'S COLOURS: HUNTING FOR ANSWERS WITH DARWIN AND DRONES

The vast region between Earth's boreal forests and the Arctic tundra is crucial to understanding climate change, but extremely difficult to investigate; satellites and drones are essential.
Dr Gareth Rees investigates how scientists today solve the same problem that confronted Charles Darwin in the 1830s – accurately representing the colours of nature.

6PM – 7PM
→ **TUE 12 MAR**
Lloyd Room, Christ's College, St Andrew's Street, CB2 3BU

NATURAL OR ARTIFICIAL INTELLIGENCE? MEASURES, MAPS AND TAXONOMIES

Presented with Cambridge University Press
Artificial intelligence is taking off while we still know very little about intelligence, and cognition as a whole. Professor José Hernández-Orallo argues that we urgently need measures to compare natural and artificial intelligence, maps to locate their future trajectories in the cognitive landscape, and behavioural taxonomies to understand a new diversity of artefacts and interactions.

6PM – 7PM
→ **TUE 12 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

"Thank you to all involved, it is really one of the best things about living near Cambridge."

IN CONVERSATION WITH THE MISKA GROUP AT THE GURDON INSTITUTE

Join us for an evening talk followed by discussion and drinks with our scientists. Professor Eric Miska discusses how life began as, and still is, an RNA world.

6PM – 8PM
→ **TUE 12 MAR**
Gurdon Institute, Tennis Court Road, CB2 1QN

A DAY IN THE LIFE OF THE IHAT-GUT CLINICAL TRIAL: OPEN EVENING

Join us to explore images from the IHAT-GUT clinical trial and hear personal stories from inspiring scientists who have travelled to remote rural Africa to investigate ways to treat anaemia and iron deficiency in young children. With live music, drinks and snacks.

6.30PM – 8.30PM
→ **TUE 12 MAR**
The Locker Cafe, 54 King Street, CB1 1LN

IT COULDN'T HAPPEN HERE: INVESTIGATING ENGINEERING FAILURES

What do collapsed bridges, crashed aeroplanes, trains and cars, and split bin bags have in common? All can result from engineering failure. Join the Technical Team, Museum of Technology, to gain an insight into how forensic engineers work, by looking at well-known, and less well known, failures that have shaped our lives.

6.30PM – 8PM
→ **TUE 12 MAR**
Cambridge Museum of Technology, The Old Pumping Station, Cheddars Lane, CB5 8LD

MEET THE DNA DETECTIVES DECODING CANCER

Grab a drink and discover how scientists are using the latest knowledge and advances in DNA technology to solve some of the biggest mysteries still facing cancer research. Hosted jointly by the Wellcome Genome Campus and Cancer Research UK.

6.30PM – 8.30PM
→ **TUE 12 MAR**
Michaelhouse Café, St Michael's Church, Trinity Street, CB2 1SU

SOLVING THE NITROGEN PROBLEM IN AGRICULTURE FOR SUSTAINABLE FOOD PRODUCTION

While developed countries rely heavily on nitrogen fertilisers, nitrogen is the single biggest limiting factor of crop yield for smallholder farmers in Africa. Dr Giles Oldroyd explores how plants in the natural environment enter symbiotic associations with microorganisms to capture nutrients like nitrogen, and how we can use these associations to enhance sustainable food security.

7PM – 8PM
→ **TUE 12 MAR**
Sainsbury Laboratory,
47 Bateman Street, CB2 1LR

PUTTING RADIOACTIVITY IN PERSPECTIVE

The UK is embarking on a renewal of its generation of electricity by nuclear power and moving towards finding a permanent home for its radioactive waste. Since the last time we made decisions like this, our understanding has developed markedly, potentially resetting our attitude to radiation and radiological risk. Professors Ian Farnan and Gerry Thomas, Imperial College London, discuss radioactivity in the natural world and the outcomes of decades of study on the health effects of radiation.

7.30PM – 8.30PM
→ **TUE 12 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

THE JOY OF STEPS

We humans have many obvious physical adaptations for effective movement. Less obvious is how our minds have been shaped by the need to move. Central to these mental adaptations is the brain's reward chemical dopamine. Drawing on research and hunter-gatherer wisdom, Dr Matt Wilkinson reveals all about these stimulating mental systems, and gives tips about how to keep them working in our modern world.

7.30PM – 8.30PM
→ **TUE 12 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

HOLOGRAPHIC PROJECTION DISPLAYS: BEYOND STAR WARS

Tim Wilkinson, Professor of Photonic Engineering and Fellow of Jesus College, introduces the real world of holographic projection displays, and demonstrates that many types of image generation are now possible, from full parallax three-dimensional displays to augmented reality. With Jesus College Intellectual Forum.

7.30PM – 9PM
→ **TUE 12 MAR**
West Court, Jesus College,
Jesus Lane, CB5 8BL

UNDERCOVER ADVENTURES IN THE WORLD OF IRRATIONALITY

Are psychics really talking to the dead? Is there any harm in selling sugar pills to the sick? What happens when you begin to ask questions? Cambridge Skeptics invite full-time skeptical investigator Michael Marshall, Good Thinking Society, to explain what happens when you go undercover to peek behind the curtain of the most unusual claims around.

7.30PM – 9.15PM
→ **TUE 12 MAR**
The Blue Moon Pub,
2 Norfolk Street, CB1 2LF
For adults only

£3 adv / £5 on door

Wed 13 Mar

PLANT JOURNEYS
In this collaboration between the Fitzwilliam Museum and the Botanic Garden, we share a story about the fascinating journeys made by plants and create a mini garden to journey home with you.

10AM – 11.30AM
1PM – 2.30PM
→ WED 13 MAR
Fitzwilliam Museum, Trumpington Street, CB2 1RB
For 2–5-year-olds and their parent or carer

UNKINDEST CUT: HARM AND HARMONY IN YOUR HEAD - PERFORMANCE
Outside it seems to be a shipping container. Inside, though, it's a fortress of ideas – intimate and intense, alluring but alarming, contained yet spilling over. *Unkindest Cut* confines and entwines dance, performance, text, film and an intricate light installation to explore how our own minds cope with modern life, confronting audiences with complex issues around young people and mental health.

12.30PM – 1PM
3PM – 3.30PM
6PM – 6.30PM
8PM – 8.30PM
→ WED 13 MAR
Cambridge Junction, Clifton Way, CB1 7GX

WHISTLER & NATURE: LOOKING BOTH WAYS FROM THE INDUSTRIAL TO THE HORTICULTURAL
Whistler & Nature casts a new light on the work of the great late-Victorian master James McNeill Whistler, an artist with a bold personality and a revolutionary attitude towards the natural world. Discover more with Patricia de Montfort and Clare Willsdon, authors of the book of the exhibition.

1.15PM – 2PM
→ WED 13 MAR
Fitzwilliam Museum, Trumpington Street, CB2 1RB

Admission by token, available from 12.45PM

INVESTIGATING THE PARANORMAL: THE ARCHIVES OF THE SOCIETY FOR PSYCHICAL RESEARCH
In 1882, a group of eminent scientists with an interest in proving the existence of ghosts, spirits and psychic phenomena convened to form the Society for Psychical Research. Using archives of the Society, deposited at Cambridge University Library, we provide a fascinating insight into the history of psychical research from the mid-19th century onwards.

5PM – 6PM
→ WED 13 MAR
Milstein Seminar Rooms, Cambridge University Library, West Road, CB3 9DR

DISCOVERING GENERATION IN ANCIENT GREECE
Dr Rebecca Flemming explores the ideas and debates about human generation that emerged in the classical Greek world. How was the process of making new human beings conceptualised and described by ancient medical writers?

6PM – 7PM
→ WED 13 MAR
Museum of Classical Archaeology, Sidgwick Avenue, CB3 9DA

FASHION THE FUTURE
Clothing and textiles account for 12% of global greenhouse emissions, and this industry is the world's second largest industrial polluter. Is fashion a frivolous affair, or could carefully choosing what we wear make a big difference to tackling the climate crisis? Explore the science of fashion and discover sustainable solutions to help green your wardrobe with Cambridge Carbon Footprint.

6PM – 7PM
→ WED 13 MAR
St Paul's, Hills Road, CB2 1JP

THE UNIVERSE OF BLACK HOLES

Black holes are nature's most extreme and exotic objects. They stretch our understanding of space and time to its limits and, in a cosmic irony, are responsible for some of the most energetic phenomena in the Universe. Christopher Reynolds, Plumian Professor of Astronomy, describes the nature of black holes, the role they play in the Universe and how future research may yet again change our view of reality.

6PM – 7PM

→ **WED 13 MAR**

Babbage Lecture Theatre,
New Museums Site,
Downing Street, CB2 3RS

Ideal for teenagers

EDIACARAN TALKS

Enjoy an exclusive wander through the galleries after hours. Meet researchers from the Department of Earth Sciences as they introduce you to a group of mysterious ancient organisms from over 550 million years ago.

6PM – 8PM

→ **WED 13 MAR**

Sedgwick Museum of Earth Sciences, Department of Earth Sciences,
Downing Street, CB2 3EQ

DISCOVERY NIGHT: A JOURNEY THROUGH THE BRAIN

The MRC Cognition and Brain Sciences Unit is a leading research centre for advancing understanding of human cognition. Join us for an evening exploring research in psychology and neuroscience through hands-on activities, experiments and short talks.

6PM – 8.30PM

→ **WED 13 MAR**

MRC Cognition and Brain Sciences Unit,
15 Chaucer Road, CB2 7EF

UNKINDEST CUT: HARM AND HARMONY IN YOUR HEAD – DISCUSSION

What has been going on in the shipping container outside Cambridge Junction? The *Unkindest Cut* explores how our own minds cope – and sometimes don't – with modern life, confronting audiences with complex issues around young people and mental health. Join artist Subathra Subramaniam, clinical psychiatrist Dr Partha Banerjea and Cambridge neuroscientists to discuss themes that inspired the work.

6.45PM – 7.45PM

→ **WED 13 MAR**

Cambridge Junction,
Clifton Way, CB1 7GX

THE DISCOVERY OF NEW VIRUSES: WHAT IS IN IT FOR ME?

Every year hundreds of new viruses are discovered. What are the stories behind the viruses we are most afraid of? Join in a discussion chaired by Dr Ingrida Olendraite, with Drs Luke Meredith, Nerea Irigoyen and Aartjan te Velthuis from the Division of Virology.

7PM – 8PM

→ **WED 13 MAR**

Department of Pathology,
Tennis Court Road, CB2 1QP

CAFÉ SCI CAMBRIDGE: THE DARWIN TREE OF LIFE PROJECT

Grab a coffee with a large slice of science and join us for an evening exploring the Darwin Tree of Life Project, which plans to read the DNA of all known species of animals, birds, fish and plants in the UK. Café Sci Cambridge is coordinated by the Public Engagement team at the Wellcome Genome Campus.

7PM – 9PM

→ **WED 13 MAR**

Espresso Library,
210 East Road, CB1 1BG

HISTORY OF ASTRONOMY AT THE INSTITUTE OF ASTRONOMY
An evening dedicated to the history of astronomy. Featuring a lecture, an exhibition provided by the Whipple Museum and (weather-dependent!) stargazing.

7PM – 9PM
→ **WED 13 MAR**
Institute of Astronomy, Madingley Road, CB3 0HA

100,000 GENOMES PROJECT: TRANSFORMING PRECISION HEALTHCARE
In partnership with illumina
A technology breakthrough that started in Cambridge has brought us to where we are able to decode the entire DNA sequence and determine mutations that cause rare genetic diseases and cancer. With all 100,000 genomes now sequenced, Dr David Bentley, Chief Scientist at illumina, and Professor Mark Caulfield, Chief Scientist at Genomics England, discuss how the 100,000 Genomes Project will revolutionise the way we practise medicine.

7.30PM – 8.30PM
→ **WED 13 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

THE VARIABLES PRESENT: AN EVENING OF SCIENCE VARIETY
Come prepared to laugh out loud as experienced science comedians and Cambridge's top new talent explore how they got into research, what they spend all day doing and why they do it at all.

7.30PM – 10.30PM
→ **WED 13 MAR**
The Portland Arms, 129 Chesterton Road, CB4 3BA
For adults only

£5.50

Thu 14 Mar

GENOME EDITING IN AGEING RESEARCH: WHAT'S ACCEPTABLE AND WHAT'S NOT?
Emerging technologies such as CRISPR-Cas9 genome editing are revolutionising the way we can edit our genetic information 'a la carte'. This Babraham Institute workshop for secondary school students explores the ethical considerations of the use of genome editing techniques for research, and is focused on how our bodies age.

10AM – 1PM
→ **THU 14 MAR**
Babraham Institute, Babraham Research Campus, CB2 3AT
For secondary school pupils

UNKINDEST CUT: HARM AND HARMONY IN YOUR HEAD – INSTALLATION

The *Unkindest Cut* installation explores how our own minds cope – and sometimes don't – with modern life, confronting audiences with complex issues around young people and mental health. The installation is a collaboration with audio-visual artists Kathy Hinde and Matthew Olden and lighting designer Aideen Malone in association with clinical psychiatrist Dr Partha Banerjea.

NOON – 2PM
4PM – 7PM
→ **THU 14 MAR**
Cambridge Junction, Clifton Way, CB1 7GX

SWITCHABLE POLYMERISATION CATALYSIS: ORDERED BLOCK POLYMERS FROM MONOMER MIXTURES

Professor Charlotte Williams, University of Oxford gives this year's Lewis Lectureship. Her research focuses on the synthesis of novel catalysts and the use of renewable resources to make polymers. In this technical talk, she discusses her development of new switchable catalysts which allow the production of polymers with tailored properties suitable for application as rigid plastics.

2PM - 3PM
→ **THU 14 MAR**
Department of Chemistry, Lensfield Road, CB2 1EW

WHAT SHOULD I DO WITH MY ARCHIVE?

Finishing up a research project or retiring? Responsible for managing project or research data and records? If you have ever asked the question "what should I do with all this stuff?" this workshop is for you!

2.30PM – 4.30PM
→ **THU 14 MAR**
Milstein Seminar Rooms, Cambridge University Library, West Road, CB3 9DR

DISCOVERING E-TEXTILES

Wearable technology is being talked about a lot right now. The Centre for Computing History shows how, with the help of some basic electronic components, like LEDs and switches, and some sewing skills, you can add some function, fashion and fun to the clothes, soft toys or something else you regularly use.

4PM – 6PM
→ **THU 14 MAR**
Centre for Computing History, Rene Court, Coldham's Road, CB1 3EW
This workshop is ideal for late Key Stage 2 and early Key Stage 3 students.

£12 / £8

HOW TO SOLVE A PROBLEM LIKE ALZHEIMER'S DISEASE: A CAMBRIDGE PERSPECTIVE

Four leading dementia researchers present current research and findings relating to Alzheimer's disease, focusing on diagnosis, understanding the disease, treatments and prevention. Sponsored by the ARUK Cambridge Research Network.

4PM – 6PM
→ **THU 14 MAR**
Department of Public Health and Primary Care, Institute of Public Health, University Forvie Site, Robinson Way, CB2 0SR

FIVE THINGS ABOUT GENETICS EVERYONE SHOULD KNOW

From human disease and intellectual ability, ethnicity and race, to sex and our origins. Dr Ewan Birney, Director of the European Bioinformatics Institute (EMBL-EBI), discusses the five things that everyone should know about genetics.

5.30PM – 7PM
→ **THU 14 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

MR DARWIN'S TREE
Andrew Harrison's compelling 75-minute solo performance focuses on the relationship between the agnostic Charles Darwin and his Christian wife, Emma, and takes us on a fascinating journey through his life and his own exploration of science, faith, love and human destiny. Followed by panel discussion. Presented by the Faraday Institute.

5.30PM – 7.30PM
→ **THU 14 MAR**
St John's College Old Divinity School, All Saints Passage, CB2 1TP

£10 + booking fee

BIODIVER-CITY: NATURE IN YOUR EVERYDAY LIFE
We'll be discussing urban ecology and the nature we see in our day-to-day lives, we'll use drawing to express the natural world we experience and help us think about what we can do to see more of it, and finish with advice on the actions we can all take to see more urban biodiversity. With the Cambridge Environment and Energy Team.

6PM – 7PM
→ **THU 14 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

ORGAN TRANSPLANTATION: PAST SUCCESSES, FUTURE CHALLENGES
Organ transplantation is a major success story of modern medicine but demand for organs still outstrips supply. Professor Mike Nicholson, transplant surgeon and Director of the NIHR Blood and Transplant Research Unit in Organ Donation and Transplantation, talks about the evolution of organ transplantation, highlighting successes and new research that might solve the organ shortage in the future.

6PM – 7PM
→ **THU 14 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

THE PSYCHOLOGY OF COGNITIVE ILLUSIONS: OR WHY THE MIND IS TRICKED
Professor Nicola Clayton and Clive Wilkins explore what cognitive illusions reveal about the psychology of the human mind: not just perception but also memory and the ability to mentally travel in time, to revisit our past experiences and reflect upon them, and to explore places we have yet to visit and imagine what they will be like.

6PM – 7PM
→ **THU 14 MAR**
Lucy Cavendish College, Lady Margaret Road, CB3 0BU

IN CONVERSATION WITH THE AHRINGER GROUP AT THE GURDON INSTITUTE
Join us for an evening talk followed by discussion and drinks with our scientists. Professor Julie Ahringer talks about how DNA packaging is important for the growth and health of living organisms.

6PM – 8PM
→ **THU 14 MAR**
Gurdon Institute, Tennis Court Road, CB2 1QN

A GUT FEELING ABOUT THE BRAIN: MICROBIOME AS A KEY REGULATOR OF NEURODEVELOPMENT AND BEHAVIOUR
Cambridge Neuroscience Public Lecture
Ever had a 'gut feeling' about something? It turns out the connection between our gut and our brain might be stronger than we think. Professor John F Cryan, University College Cork, Ireland, shares surprising facts and insights about how our thoughts and emotions are connected to our guts.

6.10PM – 7PM
→ **THU 14 MAR**
Robinson College, Grange Road, CB3 9AN

CREATING A WILDLIFE TOUR WITH THE ARCTIC SAMI

Cambridge Natural History Society Presidential Address

Kevin Hand tells the story of how an ecologist with 30 years' experience of attempts at ecotourism creates a tour, beginning with a crazy road trip in Finland and Norway with some friends, then turning it into an experience that involves and celebrates Sami culture and their intimate relationship with nature.

6.15PM – 8.30PM

→ **THU 14 MAR**

David Attenborough Building, New Museums Site, CB2 3QZ

DISCOVERY AND THE DEAD PLANTS SOCIETY

With 1.1 million plant specimens, the University Herbarium is especially rich in those collected by 19th century greats like Henslow, Darwin, and Wallace. Herbarium Curator Dr Lauren Gardiner discusses why these treasures are so important today.

7PM – 8PM

→ **THU 14 MAR**

Sainsbury Laboratory, 47 Bateman Street, CB2 1LR

WRITTEN IN BLOOD: WHAT CAN BLOOD CELLS TELL US ABOUT HEALTH AND DISEASE?

In the UK, 1.1 million people donate blood annually, directly saving lives through transfusion but blood can do so much more. Professor Emanuele Di Angelantonio discusses how blood donors contribute to the health of everyone by participating in studies that link environmental and genetic factors with properties of the blood, helping us understand the role of blood in cardiovascular disease.

7PM – 8PM

→ **THU 14 MAR**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

THE LONG-TERM PERSPECTIVE OF CLIMATE CHANGE

A long-term perspective of natural climate variability is essential for understanding present and future global warming. Professors Ulf Büntgen, Mike Hulme, Christine Lane, Hans W Linderholm, Clive Oppenheimer, Baskar Vira, and Paul J Krusic discuss how we investigate past climate and the challenges we face in applying this to the policy-making process.

7PM – 8.30PM

→ **THU 14 MAR**

Department of Geography, Downing Place, CB2 3EN

OUT THINKERS @ CAMBRIDGE SCIENCE FESTIVAL

Just like white light is made by all the colours of the rainbow, so science is made by the contributions of a cast of thousands. Meet some of Cambridge's LGBT+ researchers as they talk about their scientific work while truly being themselves – with some laughs and a lot of science along the way!

7PM – 10PM

→ **THU 14 MAR**

Cambridge Wine Merchants Wine Bar, University Centre, Granta Place, Mill Lane, CB2 1RU

For adults only

THE PUBLIC SPHERE IN THE AGE OF THE ALGORITHM

In recent years the internet has become a key battleground for electoral politics. Dr Jennifer Cobbe examines how surveillance capitalism and the increasingly algorithmic nature of online public space allow the public sphere and the democratic process to be manipulated by microtargeted political advertising, disinformation and political bots.

7.30PM – 8.30PM

→ **THU 14 MAR**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

PROFESSOR MARY DIXON-WOODS

DIRECTOR, THE HEALTHCARE IMPROVEMENT STUDIES INSTITUTE (THIS INSTITUTE)

Challenges in providing consistently high-quality, safe care are common to health systems worldwide. The NHS is no different, and like in other systems, these challenges are frustrated by weaknesses in the evidence base for how to make improvements. But my talk at this year's Science Festival is about how the NHS is uniquely well-placed to create that much-needed evidence.

Based on the 2018 Harveian Oration I delivered at the Royal College of Physicians, I will propose that instead of just trying to do improvement, we need also to study it. To avoid waste, duplication of effort, and new risks, it's important that we learn what works, what doesn't and why. That means a real commitment to evaluation and to recognising the wisdom and expertise of NHS staff, patients and carers in generating evidence that matters.

A strong evidence base for making improvements can help ensure that patients have more consistently good experiences and outcomes, but it has been far too slow to build. My team at THIS Institute, funded by the Health Foundation, is here to change that. Through rigorous studies focused on the priorities of patients and staff, we're here to create a scientific asset for the NHS about how to improve quality and safety.

www.thisinstitute.cam.ac.uk

RELATED EVENT

IMPROVING QUALITY AND SAFETY IN HEALTHCARE **P48**

CLIMATE CHANGE: AN EVENING WITH JIM LOVELOCK

Cambridge Climate Lecture Series

In his 100th year, James Lovelock talks with Chris Rapley and Helen Czerski on the theme of Climate Change, Can We Fix It? Only three months after COP24 we hear if Lovelock, the father figure of our climate concerns, remains optimistic. Is Gaia alive? Will the Earth self-regulate whatever we do?

7.30PM – 9PM

→ **THU 14 MAR**

Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

PERHAPS UNDER STARS THAT WOULD STRETCH FOREVER (AN IDIOT EXPLAINS THE UNIVERSE IN UNDER AN HOUR)

What's the point of all this? (Life.) Are there parallel universes? Want to learn everything you ever needed to know about the Universe from an idiot? (Yes.) Is the world ending? (Probably.) Joey Page is a boy with a washing machine-esque brain. Watch him make sense of the entire Universe in 59 minutes.

7.45PM – 8.45PM

→ **THU 14 MAR**

CB2 Café, 5/7 Norfolk Street, CB1 2LD

For adults only

£7.70

CHRIS STOKES: WE DON'T NEED ROADS

From BBC Three, Dave and Radio 4, Chris Stokes presents a new stand-up show about time, space, love, reality and teeth. As a child of eight, Chris went to the dentist and something happened that would ultimately affect all our lives...

9PM – 10PM

→ **THU 14 MAR**

CB2 Café, 5/7 Norfolk Street, CB1 2LD

For adults only

£7.70

"This event was SO GOOD! I had so much fun, the speaker was absolutely amazing. I was not bored at all!"

Fri 15 Mar

CATALYTIC ACTIVATION OF RENEWABLE RESOURCES TO MAKE POLYMERS AND FUELS

Professor Charlotte Williams, University of Oxford, gives this year's Lewis Lectureship. Her research focuses on the synthesis of novel catalysts and the use of renewable resources to make polymers. She discusses the development of catalysts able to transform carbon dioxide into methanol, a process which may deliver more sustainable liquid transport fuels in the future.

NOON – 1PM

→ **FRI 15 MAR**

Department of Chemistry, Lensfield Road, CB2 1EW

CHALLENGES AND ETHICAL CONSIDERATIONS OF TRANSLATING HEALTH DISCOVERY TO RURAL AFRICA

Join Dr Dora Pereira for an insight into the journey of the translation of an innovative iron supplement from the laboratories in Cambridge to clinical trials in rural Gambia.

5PM – 6.45PM

→ **FRI 15 MAR**

Pavilion Room, Hughes Hall, Mortimer Road, CB1 2EW

GM CROPS: GETTING TO THE ROOT OF THE ISSUES
Hostility towards genetically modified crops is an unfolding global drama. Dr Inanna Hamati-Ataya and Dr Matthew Holmes examine the roots of this drama in the history of plant genetics since the rediscovery of Mendel's laws, asking how we came to see the plant genome as a series of distinct parts, to be removed, added or altered at will.

5.30PM – 6.30PM
→ **FRI 15 MAR**
Alison Richard Building, Sidgwick Site, 7 West Road, CB3 9DT

TRANSFORMATION AND MIND: USING SCIENCE TO FIGHT MENTAL ILLNESS
Mental illness has dramatic effects on individuals, their families and communities. Professor Peter Jones discusses how clinical and population studies can be integrated with health services to promote mental health wellbeing. Organised by the Wolfson College Science Society.

5.45PM – 7.15PM
→ **FRI 15 MAR**
Lee Hall, Wolfson College, Barton Road, CB3 9BB

DOES THE MOTHER EVER REJECT THE FETUS
A firmly embedded view is that pregnancies in humans fail because of 'rejection' by the mother's immune system. New discoveries from Cambridge show that there are multiple mechanisms to ensure there is a peaceful environment in the uterus, where the placenta is allowed to grow and develop to support the fetus. Join Professor Ashley Moffett and friends to learn more about fetal rejection.

6PM – 7PM
→ **FRI 15 MAR**
Department of Pathology, Tennis Court Road, CB2 1QP

PAST CLIMATE VARIABILITY AND HUMAN HISTORY
Join the Department of Geography on a journey around the world and through the past few thousand years, addressing two fundamental questions: how has climate variability helped to shape human history, and how have climate changes affected human and social wellbeing in the past?

6PM – 7PM
→ **FRI 15 MAR**
Department of Geography, Downing Place, CB2 3EN

PUZZLING SURPRISES
Some of the greatest insights into maths come from doing puzzles. Be prepared for some surprises as maths and puzzle gurus Dr Hugh Hunt and Rob Eastaway share some of their favourite examples, many of them linked to real-world situations.

6PM – 7PM
→ **FRI 15 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Ideal for teenagers

IN CONVERSATION WITH THE BRAND GROUP AT THE GURDON INSTITUTE
Join us for an evening talk followed by discussion and drinks with our scientists. Professor Andrea Brand talks about stem cells in the brain.

6PM – 8PM
→ **FRI 15 MAR**
Gurdon Institute, Tennis Court Road, CB2 1QN

GENE EATING: THE TRUTH ABOUT DIETS
Each New Year brings new diets and health fads. But what actually works? Dr Giles Yeo explores how to break the cycle of pseudoscience and misinformation surrounding the world of dieting as he discusses his new 'anti-diet' diet book.

7.30PM – 8.30PM
→ **FRI 15 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

DR LAUREN GARDINER

CURATOR OF THE UNIVERSITY HERBARIUM, BOTANIST, EXPLORER

Britain is a nation of garden lovers, yet few people have any idea of how many of the familiar plants they grow and love were discovered in the wild. With 1.1 million specimens, Cambridge University Herbarium (part of the Department of Plant Sciences), is especially rich in the original specimens used to describe new species, including many which are well-known garden plants today. As the first Curator of the collection for many years, I am lucky enough to be responsible for its continued preservation and future use in research and teaching.

The Herbarium represents over more than 300 years of species discovery and expeditions all over the world. The 19th century specimens include those collected by some of the great Victorian scientists and explorers, including John Stevens Henslow, Charles Darwin, Alfred Russel Wallace, John Lindley, David Douglas, and Richard Spruce.

In my talk I'll be revealing some of these treasures and the extraordinary stories behind them and the long-deceased but intrepid collectors who found them. Find out why these specimens are so important today for scientific as well as historical research, and how many of the specimens have never been studied since they arrived in Cambridge well over a century ago. These specimens are being re-discovered now, including a particularly exciting one recently found in the collection which will be revealed for the first time during the Festival.

Visit our pop-up Herbarium too, and see how and why herbarium specimens are still made today, some of the uses of the specimens and why they are still so important for modern scientific research – especially for conservation and DNA-based studies.

RELATED EVENTS

DISCOVERY AND THE DEAD PLANTS SOCIETY
P20

POP-UP HERBARIUM IN THE PLANT AND LIFE SCIENCES MARQUEE
P29

Sat 16 Mar

GAME OF BONES

Around 65 million years ago, a huge meteorite smashed into our planet, wiping out dinosaurs and allowing the mammals to rise to power. But this was only one episode in an epic struggle between two great animal dynasties. Over the last 300 million years, the fortunes of these groups have risen and fallen. Dr Matt Wilkinson charts this battle for supremacy: one that created the living world as we know it.

10AM – 11AM
→ **SAT 16 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Great for families

TRUFFLE HUNTS IN THE BOTANIC GARDEN

Professor Ulf Büntgen and Lucy, an experienced truffle hunting dog, lead us on a hunt in the mysterious kingdom of the underground truffle world. While searching for fruit bodies of the Burgundy truffle, we learn about the yet unknown variety of possible host plants, as well as the complex ecological factors responsible for the growth and ripening of one of the most iconic ectomycorrhizal fungi.

10AM – 11AM
2PM – 3PM
→ **SAT 16 MAR**
Botanic Garden, 1 Brookside, CB2 1JE

THE SCIENCE OF PERFUMERY

Embark on an olfactory journey uncovering how our sense of smell works and the role artisan scents can play in enhancing our wellbeing with Mohammed Jamal of Jamal Perfumers London.

10AM – NOON
1.30PM – 3.30PM
→ **SAT 16 MAR**
SUN 17 MAR
Judge Business School, Trumpington Street, CB2 1AG
For adults only

ANIMAL EXPLORERS

Discover the amazing diversity of animal life at the Museum of Zoology. Get hands-on to find out about the science of zoology. Meet live insects, uncover skulls and go on a safari around the galleries.

10AM – 4.30PM
→ **SAT 16 MAR**
Museum of Zoology, New Museums Site, Downing Street, CB2 3EJ
Great for families

MIRROR PILLAR

The Mirror Pillar is a giant 2m high cylindrical mirror, which reflects and distorts images from the ground around it to create beautiful anamorphic artworks. Find us in the Grand Arcade, where you can interact with anamorphic images by drawing and colouring, discover the mathematics and geometry behind projected and distorted images, and help build a giant picture!

10AM – 4PM
→ **SAT 16 MAR**
11AM – 4PM
→ **SUN 17 MAR**
Cambridge Grand Arcade, CB2 3QF
Great for families

CHAOS TALKS AT CRASH, BANG, SQUELCH!
Discover all sorts of weird and wonderful science with talks from our CHaOS volunteers.

10AM–10.30AM: Help, I'm radioactive! How chain reactions power the world. With Yaron Bernstein.
11AM–11.30AM: Yellowstone's Hot Plume: a mushroom of doom? With Simon Thomas and Sophie Miocevich.
NOON–12.30PM: Are you smarter than a computer? With Tom Webster.
1PM–1.30PM: Emperors, Spies and Seaweed: writing messages only you can read. With Matthew Le Maitre and Ben Akrill.
2PM–2.30PM: Berserk Fireworks. With Andrew Sellek.
3PM–3.30PM: You can be an engineer too: designing the world around you. With Finlay Knops-McKim.
4PM–4.30PM: Taking pictures as a vet: how to see inside your pet. With Jennifer Simpson.

10AM – 4.30PM
→ **SAT 16 MAR**
Department of Zoology, New Museums Site, Downing Street, CB2 3EJ

CHAOS ROBOTICS WORKSHOPS AT CRASH, BANG, SQUELCH!
Join CHaOS students for robotics workshops packed full of hands-on design and programming. Zero experience is required; we'll teach you all the basics and you can start making your own robots do amazing things in no time at all!

10.15AM – 11AM
11.15AM – NOON
1PM – 1.45PM
2PM – 2.45PM
3PM – 3.45PM
→ **SAT 16 MAR**
Department of Zoology, New Museums Site, Downing Street, CB2 3EJ

DISCOVER POLAR SCIENCE: FAMILY DAY
Join us for a day of discovery as we explore the amazing science from the coldest and harshest environments on Earth! Includes object handling, experiments and crafts all day, and the chance to meet intrepid polar scientists from the British Antarctic Survey.

10.30AM – 3.30PM
→ **SAT 16 MAR**
The Polar Museum, Scott Polar Research Institute, Lensfield Road, CB2 1ER

SUPER SCIENCE SATURDAY
Celebrate Super Science Saturday with members of the Sedgwick Museum and the Department of Earth Sciences in the beautiful surroundings of the Watson Gallery, located under the Museum steps. Meet our researchers, explore new ideas and immerse yourself in the wonders of science.

10.30AM – 4PM
→ **SAT 16 MAR**
Department of Earth Sciences, Downing Street, CB2 3EQ

THE SCIENCE OF ARCHAEOLOGY
Were Neanderthals fussy eaters? What can bones tell us about a person's life? How were these stone tools made? What happened to this animal after its death? What did ancient Mesopotamia smell like? Science can help archaeologists answer these questions and many others. Discover the secrets revealed by pots, plants, soil, bones, textiles and maybe even fossilised poo!

10.30AM – 4PM
→ **SAT 16 MAR**
McDonald Institute for Archaeological Research, Downing Street, CB2 3ER

NOW YOU SEE ME, NOW YOU DON'T: VISION, CONTRAST AND CONCEALMENT
The visual system has evolved to detect objects, including other animals, against their background. But these other animals may not wish to be seen and perhaps eaten! Dr Hugh Matthews examines what the visual system is looking for, and how visual detection may be confounded.

11AM – NOON
→ SAT 16 MAR
Physiology Lecture Theatre, Physiological Laboratory, Downing Site, CB2 3EG

JUST BUGS!
Bugs are all around us, but how do scientists use them to understand the nitty-gritties of the human body? Enter the basement of the Department of Zoology and discover what we learn by looking at insects in the laboratory – from fruit flies to crickets to friendly burying beetles!

11AM – NOON
NOON – 1PM
1PM – 2PM
2PM – 3PM
3PM – 4PM
→ SAT 16 MAR
Department of Zoology, New Museums Site, Downing Street, CB2 3EJ

WHAT'S TRUE AND WHAT'S NEW
Walk with the Society of Cambridge Tourist Guides and discover where some of the really cool big ideas came from. Awesome breakthroughs, controversial lightbulb moments and explosive insights revealed!

11AM – 12.30PM
1.30PM – 3PM
→ SAT 16 MAR
SAT 23 MAR
Meet outside The Guildhall, Market Square, Cambridge, CB2 3QJ

DECODING LIFE
Visit the Department of Biochemistry and become a scientist for the day! Chart the molecules of life by coding DNA to protein, describe the making and purification of proteins and how they look in three dimensions, and see how drugs work and how mutations can cause them to fail.

11AM – 3PM
→ SAT 16 MAR
Department of Biochemistry, Hopkins Building, Downing Site, CB2 1QW

TREE TRAIL
Do you know your oaks from your ashes? Take part in the tree trail around the Botanic Garden and find out how to identify different types of British trees, why tree identification is important for saving British trees and what you can do to help.

11AM – 3PM
→ SAT 16 MAR TO SUN 24 MAR
Botanic Garden, 1 Brookside, CB2 1JE

Normal admission charge

GENES AND HEREDITY
Have you ever seen strawberry DNA? Or fruit flies under a microscope? Join researchers in the Department of Genetics for activities to discover how genetics pops up in our everyday life.

11AM – 4PM
→ SAT 16 MAR
Department of Genetics, Downing Site, CB2 3EH

"Fab Festival, we are so lucky here in Cambridge to have access to all this wonderful research and information."

PLANT AND LIFE SCIENCES MARQUEE

10AM – 4PM
→ **SAT 16 MAR**
Marquee on the Lawn, Downing Site, CB2 3EA

FRONTIERS OF PLANT BREEDING AND GENE EDITING IN CROPS
Humans have always had an effect on the genetics of the crops they grow. Plant breeding came into its own in the last century and, with the explosion of genetic resources now at our feet, we present how NIAB is at the frontier of plant breeding and gene editing.

MESSING WITH INSECTS' MINDS: THE SNEAKY WORLD OF PLANT VIRUSES
Plant viruses cause many important crop diseases and are an increasing threat to food security. The Plant Sciences Department Virology Group investigates how viruses manipulate the behaviour of insects that transmit viruses from one plant to another. We show how some viruses can make plants smell or taste different to insects – tricking them into spreading disease and causing epidemics.

MISSION: MILLETS FOR THE MILLIONS – INTRODUCING TASTY TREATS FROM AN ANCIENT GRAIN
Millets are quick to grow, full of important nutrients and a key crop of the semi-arid tropics in Asia and Africa due to their resistance to heat and drought. In the UK, this small, round, golden seed is best known as bird food, but we want to demonstrate that it is a very tasty food source for us as well.

OLFACTORY COCKTAIL PARTY
Would you be able to recognise your partner's perfume in a crowded, dark room? How accurate is your sense of smell compared with that of the average person? How would you fare against a mouse instead? Come to the Galliano Lab's Olfactory Cocktail Party and test yourself!

WHAT CAN A FISH TELL YOU ABOUT YOUR BRAIN?
What is a zebrafish, and why do scientists use it? Look at zebrafish embryos under the microscope and learn about the different stages of brain development. You can also play our protein jigsaw puzzle to learn how the brain builds up its different tissue. With the Buckley Lab.

DISCOVER HOW PLANTS SENSE THE WORLD
Discover how plants sense and respond to the world around them with the help of researchers from the Sainsbury Laboratory.

ELECTRORECEPTION: A SIXTH SENSE
How do fishes use electroreception as an additional sense, and how does this system develop? With the Baker Lab.

POP UP HERBARIUM: WHY KEEP A MILLION DEAD PLANTS?
Find out more about the University's Herbarium, a hugely scientifically and historically important collection of over a million plant specimens, collected by some of the great scientists and explorers of the last 300 years.

FRUIT-FLY MOVIE STARS AND BODY SHAPE DEVELOPMENT
How does the shape of a body develop from a ball of cells? Fruit-fly movie stars help us make sense of this fascinating process. Join members of the Sanson Lab and look at fluorescent flies under the microscope, watch movies of them, and learn about the things your cells did before you were born to help make you who you are (or at least what you look like!).

NEURONS FEEL THE FORCE
How do brain cells explore their environment? It turns out they use simple physics! Play our interactive computer game, feel some realistic model tissues and find out more about how cells use tissue mechanics to guide their growth and motion. With the Franze Lab.

PARTNERS FOR LIFE: THE STORY OF AN ANCIENT ALLIANCE
Ever wondered what enabled plants to colonise the Earth 450 million years ago? Join members of the Cereal Symbiosis Group on an evolutionary journey and discover the hidden secrets of a fascinating lifelong relationship between plants and beneficial fungi.

UNDERSTANDING YOUR BODY
How does your body work? Have you ever wondered what you look like inside? Meet our junior anatomy demonstrators and enjoy fun activities like a giant operation game, anatomical body painting and Velcro costumes you can attach bones to!

SECRET CONVERSATIONS BETWEEN PLANTS AND FUNGI BENEATH OUR FEET

Join plant science researchers at the Botanic Garden to discover more about the vital, but relatively unexplored, relationships between plants and mycorrhizae, their beneficial underground fungal partners.

11AM – 4PM
→ SAT 16 MAR
SUN 17 MAR
SAT 23 MAR
SUN 24 MAR
NOON – 2PM
→ WED 20 MAR
Botanic Garden, 1 Brookside, CB2 1JE

Normal admission charge 

FILMING FAMILIES IN ACTION: CAN YOU SPOT HOW BABIES GIVE MESSAGES TO THEIR FAMILIES?

Filming families is special. It allows us to replay something interesting and talk about what's going on. Researcher Guy Skinner and clinical psychologist Dr Helen Beckwith need your help to spot how babies communicate with the people looking after them about their wants and needs. Some of our most fun projects look at how dogs do this with their owners – we'll ask for your help with these too!

11.45AM – 12.45PM
→ SAT 16 MAR
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Great for families

AUTISM IN A DISH

Autism is associated with altered connections of brain cells during development. Cutting-edge techniques allow us to grow brain cells in the lab with the same genetic changes found in autism. Dr Susanna Mierau explores how these techniques can be used for studying brain development in a dish and how they can lead to therapies for autism and related disorders.

12.15PM – 1.15PM
→ SAT 16 MAR
Physiology Lecture Theatre, Physiological Laboratory, Downing Site, CB2 3EG

BUILDING A HUMAN BEING FROM A SINGLE CELL

Life starts from a single cell, the zygote. How is a single cell capable of giving rise to the complexity of the human being? In a journey through embryogenesis, Dr Matteo Mole explores the initial stages of life, during which the zygote transforms into the complex 3D embryo, laying the foundation of our future body plan.

2PM – 3PM
→ SAT 16 MAR
Physiology Lecture Theatre, Physiological Laboratory, Downing Site, CB2 3EG

MATHS: IT'S ALL GREEK TO ME!

You've probably heard of Pythagoras, Archimedes and Plato, but do you know the sins behind their stories? From murder and deceit to running naked down the street, the Ancient Greek mathematicians were anything but boring. Dr Tom Crawford tells you all about their mischief – mathematical or otherwise – as he brings the history of maths to life (with live experiments and togas).

2PM – 3PM
→ SAT 16 MAR
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Ideal for teenagers

MILLETS FOR THE MILLIONS: SWITCHING TO SMALL GRAINS FOR SUSTAINABLE FARMING

Join Professor Martin Jones and Dr Shreya Sinha from the TIGR2ESS programme on a journey to India through the development of Indian agriculture, from the prehistoric beginnings of farming, via the rapid changes following the Green Revolution in the 1960s all the way to today's challenges faced by female farmers.

2PM – 3PM
→ SAT 16 MAR
Department of Plant Sciences, Downing Street, Cambridge, CB2 3EA

DEPARTMENT OF CHEMISTRY

Supported by the Walters Kundert Charitable Trust

10AM – 4PM
→ SAT 16 MAR
Department of Chemistry,
Lensfield Road, CB2 1EW

EIFFEL SCIENCE: 150 YEARS ON!
Along with the Eiffel Tower, the telephone, the monoplane and the first solar-powered engine were on display at the Paris World Fair of 1878. Join Planetari at the Alliance Française to explore the technology we need to meet the needs and dreams of the world in 2028. And build your own Eiffel Tower too!

2PM – 4PM
→ SAT 16 MAR
Alliance Française Cambridge, 60 Hills Road, CB4 2JB

SENSING THE NATURAL WORLD: DETECTION AND AVOIDANCE
Dr Hugh Matthews, Dr Elisa Galliano and colleagues consider how the special senses can be used to analyse the natural world and search for things within it, and how such detection might be avoided if the target does not want to be found.

3.15PM – 4.15PM
→ SAT 16 MAR
Physiology Lecture Theatre, Physiological Laboratory, Downing Site, CB2 3EG

CHEMISTRY IN ACTION
Hands-on activities, demonstrations and games with students and researchers from the Department of Chemistry.

FUN WITH CRYSTALS WITH THE CAMBRIDGE CRYSTALLOGRAPHIC DATA CENTRE
Join researchers from the Cambridge Crystallographic Data Centre and explore the wonders of crystals and structural chemistry using data from nearly one million experimental datasets.

WOODEN SKYSCRAPERS: HOW HIGH-TECH TIMBER COULD CHANGE THE WAY WE LIVE
Visit the Centre for Natural Material Innovation's hand-built wooden exhibit, and learn how we combine science and architecture to design 300m tall skyscrapers from timber! Find out why wood is good, what makes wood strong and how to stop wood from burning.

TABLE TALK: A LECTURE CELEBRATING THE 150TH ANNIVERSARY OF MENDELEEV'S PERIODIC TABLE
In celebration of the International Year of the Periodic Table, Dr Peter Wothers presents a demonstration lecture exploring how the iconic arrangement came about, what it means and how it works.
Warning: LOUD BANGS!

11AM – NOON
1.30PM – 2.30PM
4PM – 5PM
→ SAT 16 MAR
2PM – 3PM
→ SUN 17 MAR
7PM – 8PM
→ MON 18 MAR
BMS Lecture Theatre, Department of Chemistry, Lensfield Road, CB2 1EW
Great for families

DEPARTMENT OF ENGINEERING

10AM – 4PM
→ **SAT 16 MAR**
Department of Engineering, Trumpington Street, CB2 1PZ

A BALLROOM DANCE OF ELECTRON PAIRS: A BRIEF INTRODUCTION TO SUPERCONDUCTIVITY
Discover how major breakthroughs in medical resonance imaging, railway transportation and particle detection have been made possible thanks to the unconventional properties of superconductors. Find out some of the potential applications of future technologies such as spintronics.

10AM – 11AM

ADMISSIONS INFORMATION AT THE DEPARTMENT OF ENGINEERING
Admissions gurus from the Department of Engineering are on hand to answer questions from prospective students.
Ideal for teenagers

FUTURE INFRASTRUCTURE AND THE BUILT ENVIRONMENT
Survive the tsunami by building defences to protect your coastal city from an oncoming dramatic tsunami of balls! Stay grounded and discover how soil and earth support building structures with the help of research students from the Centre for Doctoral Training in Future Infrastructure and Built Environment.

HOVERMAGIC WITH THE DEPARTMENT OF ENGINEERING
What makes a hovercraft toy car go? What makes it go straight? What makes it go faster? Does adding a skirt or fins improve the movement? Join Cambridge engineers and design, make, test and modify battery-powered toy hovercraft and also explore the science that makes them work.

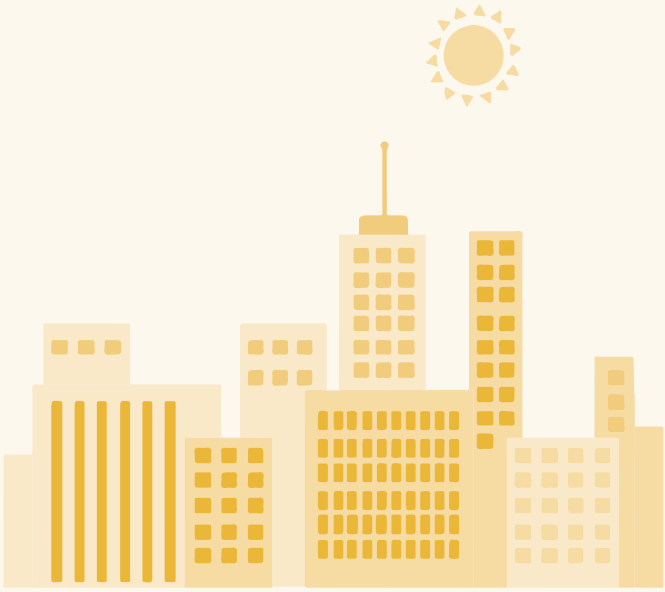
PUTTING THE CLEAR IN NUCLEAR
From radioactive waste to space exploration (yes, space!) there's a story to be told. Let researchers from the University of Cambridge, Imperial College London and the Open University tell you more!

TTP FULL BLUE RACING DRIVING SIMULATOR
TTP Full Blue Racing is the University's Formula Student society. We design, build and race single-seater cars, and have created a racing simulator so you can time trial around our track in the chassis of a real race car.

BUILD AN ELECTRONIC SENSOR WITH AN ARDUINO MICRO-CONTROLLER
Ever wondered how a digital thermometer works? Build one yourself from scratch using an Arduino micro-controller, and learn about the basic electronics and software behind everyday sensors.

10.30AM – 11.15AM
11.15AM – NOON
NOON – 12.45PM
Ideal for teenagers

"Long may it last! The Festival is a wonderful way of helping people to understand the importance of science in our lives."



THE SCIENCE OF ICE CREAM
Investigate the incredible material properties of ice cream and find out about its industrial manufacture. Discover the science behind why ice cream tastes so good with the help of researchers from the Department of Materials Science and Metallurgy, and taste our home-made ice cream, which we make using the ultra-fast cooling power of liquid nitrogen.

11.45AM – 12.45PM
1.15PM – 2.15PM

PLASTIC PLANET
David Attenborough's Blue Planet highlighted the devastating effect that waste plastic has on our environment, should it just be banned? There are other sides to the story: packaging can save huge amounts of resources if used and disposed of wisely. Dr Claire Barlow looks at the big picture around the environmental consequences of plastics for packaging and examines the alternatives.

1PM – 2PM

SMART BUILDING, SMART CONSTRUCTION
Join researchers from the CSIC and Laing O'Rourke Centre for hands-on demonstrations with Microsoft HoloLens, and acoustic and fibre optic sensors to discover how we use technology to make infrastructure smart.

1PM – 4.30PM

AN ENGINEER PLAYS WITH TOYS
Engineers are just grown-up children playing with toys – big toys. Dr Hugh Hunt is well-known as a Channel Four TV presenter – *Dambusters*, *Colditz*, *Zeppelins* ... Here's a chance to see some of his toys in action. He'll be playing with blocks, balls, bikes and boomerangs.

2.15PM – 3.15PM

ENGINEERING DISCOVERY: THE APPLICATION OF SCIENCE IN MODERN VEHICLES WITH JAGUAR LAND ROVER
The modern car contains an extraordinary combination of technology, providing convenience, safety and comfort to drivers and their passengers. How engineers use fundamental mathematics and the physical sciences in simulation models from the simplest to the most complex is illustrated by examples from the development of the award-winning Land Rover Discovery Sport.

4PM – 5PM

DEPARTMENT OF PATHOLOGY

10AM – 4PM
→ **SAT 16 MAR**
Department of Pathology, Tennis Court Road, CB2 1QP

DISEASE DETECTIVES: OUTBREAK ALERT
Demonstrate your detective skills! There's an outbreak and we need your help to find the cause. Discover how to identify infections and how we beat them!

10AM – 11AM
11.30AM – 12.30PM
1PM – 2PM
2.30PM – 3.30PM

BEASTLY BACTERIA AND PESKY PARASITES
Discover how disease-causing bacteria and parasites deploy molecular weapons to wreak havoc in the human body, by joining us for a game of hector the vector, and find out how we can fight these tiny foes!

DISCOVER THE MOST IMPORTANT ORGAN YOU NEVER KNEW YOU HAD!
For the first nine months of our lives we are totally dependent on our placenta. Find out how we are discovering that the growth and development of this vital organ are controlled by trophoblast cells talking to your mother's immune system, and how this can control the size of your brain!

GROW YOUR OWN CRYSTALS
Learn how to crystallise a protein and look down a microscope to see your crystals grow. Growing crystals is important for our research; we use them to work out the detailed structures of proteins wthat are important for health and disease.

HANDS-ON WITH DNA AND CELLS
Build cells, make blood and extract DNA with the help of researchers from the Cellular and Molecular Pathology Division. Discover the structure of DNA, how it is packaged and find out why it matters when studying disease.

MIXED-UP MICROBIOMES
Become an expert microbiology detective! You've mixed up your microbiome sequencing data and forgotten which animal it is. Using a computer to analyse the bacteria, viruses and fungi in the sample, unravel the mystery and determine which species it comes from.

NATURAL KILLERS!
Learn about the life of a natural killer cell and the roles natural killer cells play around your body. How they defend against pathogens and cancer and how your genes shape the way your natural killer cells influence your risk of diabetes, pre-eclampsia and successful transplantation.

VIRUS ROULETTE
RNA viruses like flu, Ebola and measles consist of proteins, a membrane and genetic information. Build your own virus and use the 'Wheel of the Host' to discover which components are essential to let your virus thrive.

YOUR AMAZING IMMUNE SYSTEM
Join immunologists to learn all about your amazing immune system. Discover the ways our bodies seek out and destroy pathogens, and explore how vaccines work to protect us from diseases.

THE PATH CAF
Looking for somewhere to relax and take a short break? Join us in the Path Caf for a cuppa and a chat with our scientists!

10.30AM – 3.30PM

INSTITUTE OF CONTINUING EDUCATION

2PM – 5PM

→ **SAT 16 MAR**

Institute of Continuing Education, Madingley Hall, Madingley, CB23 8AQ

WE ARE MADE OF VIRUSES

Have you ever wondered what we are really made from? Have you ever considered how important viruses are in making us who we really are? Discover just how central viruses are to our everyday lives.

2PM – 2.30PM

DISCOVER A WORLD OF SCIENCE

Join us for hands-on activities to complement and expand our science talks from the afternoon.

GOOD GERMS, BAD GERMS? HOW DO WE KNOW?

Discover how our bodies can tell which germs are good for us and which are bad.

HERBS AND THEIR SENSORY SECRETS

Explore and discuss your senses with a local professional herbalist; includes practical experiments involving feel, taste, smell and hearing.

UNDERSTANDING CANCER

Discover the basics of cancer. What is it? How does it come about? What can we do?

2.45PM – 3.30PM

THE BEAUTY OF BIOMATERIALS

Does nature have the best materials? Discover how modern engineering is taking advantage of the ingenuity of nature.

3.30PM – 4.15PM

DEPARTMENT OF PSYCHOLOGY

10AM – 4PM
→ **SAT 16 MAR**
Department of Psychology, Downing Site, CB2 3EB

BRAINWAVES, RHYTHM AND LANGUAGE
Have you ever wondered how we learn language? And which brain mechanisms might support this? Join researchers from the Centre for Neuroscience in Education to find out more about the research we do, and take part in experiments that harness the power of your brainwaves to move a virtual box!

10AM – 2PM

A LIVE EXPERIMENT: COMPUTER-BASED TASKS THAT ASSESS CHILDREN'S MEMORY
How does your memory develop during middle childhood? Do lifestyle factors such as diet and physical activity affect your memory development? Join us to find out!

BE THE RAT
Rats can be trained to perform quite advanced tests. We can test how impulsive, compulsive or attentive they are, which helps us understand the mechanisms underlying a range of psychiatric disorders. Join us and try to be a rat performing a behavioural touch screen test; see if you can earn a reward!

CAN YOU CONTROL YOUR IMPULSES?
Join researchers from the Department of Psychology and take part in tasks related to impulsivity and cognitive control, and find out how impulsive you are compared with the general population.

THINKING THE HEALTHY WAY: DOES THINKING STYLE RELATE TO MENTAL WELLNESS?
Several factors contribute to mental health problems, including how we think about ourselves, others and the world around us, regardless of which beliefs we hold. Chaired by Dr David Good, Professors Valerie DeMarinis, Siobhan O'Neill and Claire Hughes and Drs Feriha Peracha and Russell Razzaque discuss whether we can change the way we think without changing what we think?

11AM – NOON
Psychology Lecture Theatre

"Living in Cambridge which has THE world experts in some subjects is brilliant and the Science Festival gives me the chance to hear them and question some of them personally."

DON'T BELIEVE EVERYTHING YOU SEE
How does the brain piece together information from the senses to interact with a rapidly changing world? This is a challenge for the brain that underlies important skills such as recognising friends, moving our bodies to interact with, or avoid, objects and working out where we are in the world. Visit the Adaptive Brain Lab stall to find out how the brain puts it all together!

OPENING A WINDOW INTO THE BRAIN
Using microscopes, get acquainted with the anatomical landscape of the brain and identify structures and neurons from individuals displaying addiction and compulsive behaviour.

HOW DOES MOOD AFFECT TASTE?
How does mood affect taste? Take part in a research study and find out! In this interactive event, researchers from the Psychology Department measure your mood and ask you to taste a range of biscuits!

NOON – 4PM

ADDICTION: A BACK DOOR IN THE BRAIN
Dr David Belin shares recent insights into the mechanisms by which commonly abused drugs hijack our learning and motivational brain systems to trigger the maladaptive, compulsive, drug-seeking habits that typically those who suffer from an addiction find hard to break.

2PM – 3.30PM
Psychology Lecture Theatre

THE (NOT SO) SECRET LIVES OF FOUR-YEAR-OLDS
Discover how young children think, feel and play. Using video clips, we introduce participants to methods of testing young children's higher-order cognitive functions, empathy, mind-reading and social competence – and discuss the interplay between these constructs.

3PM – 6PM

THE GUILDHALL

10AM – 5PM
→ **SAT 16 MAR**
NOON – 4PM
→ **SUN 17 MAR**
The Guildhall, Market Square, CB2 3QJ

24/7/365
Whether you're awake or asleep your body is working hard to keep you healthy – and that needs fuel! Discover more about how a body uses energy from food and what can happen if things go wrong. Bring your questions for scientists from the Metabolic Research Laboratories and the MRC Metabolic Diseases Unit.

A GUIDE TO UK CUTTLEFISH, SQUID AND OCTOPUSES
See and touch exquisite fossils that are hundreds of millions of years old, and use ID guides to learn more about cephalopods in our waters. Dr Gavan Cooke, Anglia Ruskin University, is on hand to explain more about his cephalopod citizen science project and how you can help!

BACK TO THE FUTURE: DISCOVERING THE 3RS OF ANIMAL RESEARCH
Discover how good science and good laboratory animal welfare go hand in hand at the University of Cambridge by exploring the past, present and future of the 3Rs: replacement, reduction and refinement.

CHEMISTRY IN YOUR CUPBOARD
Chemistry is a part of us and all around us. Visit the Royal Society of Chemistry and explore the amazing chemistry that surrounds you every day, from the chemistry in your bathroom to the chemistry in your kitchen.

CRIME SCENE IDENTIFICATION: FROM FINGERS TO FOOTWEAR
Take a closer look at the marks left behind at scenes of crime, from fingerprints to footwear marks, and find out what makes you unique. Presented by Anglia Ruskin University.

DISCOVER NEUROSCIENCE WITH CAMBRAIN
Join CamBRAIN scientists to find out more about neuroscience. Make your own neuron: we each have a hundred billion neurons; what happens when they go wrong? Or make a brain hat and see what different areas of your brain do!

DISCOVERING FORMULATION
Join MedImmune and AstraZeneca scientists to discover how we can change the viscosity of our injected medicines so that they are easier to use. Can you find the best excipient?

DISCOVERING SEPSIS
Sepsis is a life-threatening condition. Meet researchers from Public Health England and learn about bacteria that cause sepsis, and how early signs may be recognised, to enable prompt treatment.

DISCOVERING THE SECRET LIVES OF CELLS
Join researchers from the Cambridge Institute for Medical Research to unravel the mysteries of cells! Discover how we use microscopes to follow dynamic cell behaviours and how this can help us understand what goes wrong in disease.

→ **SAT ONLY**

EXERCISE AND ENERGY
How much energy do we actually use when exercising? Join the Cambridge Centre for Sport and Exercise Sciences, Anglia Ruskin University, to find out. Have a go at cycle-based work and see how long and hard you would need to exercise to burn the calories in a pizza.

EXPLORE YOUR GENES: DISCOVER YOUR PAST
Join genetic counsellors, doctors and clinical scientists from the CUH Medical Genetics Department on a journey to uncover your genetic ancestry. Explore how we identify genetic differences in your DNA, and journey through our ancestry map to discover your hidden past!

→ SUN ONLY

FUN WITH STATISTICS
Discover how researchers at the MRC Biostatistics Unit turn data into knowledge. Play our game of statistics, skill and luck. Tease your brain with our app-based probability puzzle, and find out how statisticians understand the different elements of diseases to improve patient care.

→ SAT ONLY

GET TO GRIPS WITH GENOMICS
Get to grips with genomics and biodata through a range of hands-on activities with researchers from the Wellcome Genome Campus. Explore how studying DNA can enable us to delve into our past, present and maybe even our future.

→ SUN ONLY

GETSET
Find out what it is like to study science, engineering or technology at the University of Cambridge. We will be available until 2pm to help prospective applicants, parents and teachers GetSET for the future.

10AM – 2PM
→ SAT ONLY

HANDS-ON BIOLOGY WITH HILLS ROAD SIXTH FORM COLLEGE
Join staff and students from Hills Road Sixth Form College to have a go at our arthropod identification and smells quizzes, take on the mirror challenge and learn about biological specimens

HOW DO MUSCLES GENERATE FORCE?
Join scientists from Anglia Ruskin University Centre for Sport and Exercise Sciences to discover how muscles generate force as they lengthen and shorten. Have a go at a drop jump onto a force plate and a vertical jump, and compare your scores with the world record.

INSTITUTE OF ENGINEERING AND TECHNOLOGY
See how technology allows energy to be stored to run a train with engineers from the IET. Make your own LED torch to take away, watch how plasma can create light and discover how Faraday's law can 'slow' gravity.

MEET THE SCIENTISTS
Pop into our science booth and have a chat with our scientists about their research!

MISSION POSSIBLE WITH NIHR CAMBRIDGE BRC!
Grab your research passport and join fellow travellers on a voyage of discovery around the National Institute for Health Research Cambridge Biomedical Research Centre. Your mission: find ten medical discoveries made on site by our researchers – including the artificial pancreas to control blood sugar and the pill on a string to detect throat cancer.

→ SAT ONLY

OPEN SCIENCE, OPEN DATA WITH INTERMINE
Big data and data science are critical to helping scientists face challenges like curing cancers and making food grow. InterMine researchers show how data sharing benefits scientific discovery and medical research.

→ SUN ONLY

PHARMACOLOGY OF THE HEART
Join researchers from the Department of Pharmacology and experiment with our SimHeart virtual laboratory, and discover how your body knows when you've taken a medicine.

RACE AGAINST THE AGEING CLOCK
Are you as old as you feel? Recent research has uncovered an ageing clock in all our cells that reveals whether you are ageing quickly or slowly. Knowing this could reveal who is at risk of age-related diseases. Could we slow down ageing? Find out with researchers from the Babraham Institute.

SYNTHETIC BIOLOGY: CREATE A NEW PROTEIN!
Join MRC Laboratory of Molecular Biology scientists to design and create your own model protein using concepts from synthetic biology, and learn how synthetic biology is changing our lives.

→ SAT ONLY

THE DIET DISCO!
Put on your dancing shoes and join researchers from the Clinical Research Facility to discover how much dancing raises your heart rate! How long do you think you'd have to dance to burn off a Mars bar? Embarrassing dance moves from parents fully encouraged!

→ SAT ONLY

THE HEART: A SENSATIONAL PHENOMENON
Explore the fascinating world of the human heart. Discover how the heart develops into your first organ when embryonic cells sense complex cues, and how our cardiovascular researchers mimic this process in a dish. Find out what makes your heart race when you exercise, are scared or even fall in love.

THE QUEST FOR THE CHEMICAL ORIGIN OF LIFE
A step-by-step adventure with the MRC Laboratory of Molecular Biology going back in time to build the first molecules and assemble the primordial cells that kicked off modern life.

→ SUN ONLY

THE WONDERFUL WORLD OF BACTERIA: HOW CLEAN ARE YOUR HANDS?
How well do you really wash your hands? Discover how germs can be spread on items we regularly touch, even when we wash our hands. Presented by Anglia Ruskin University.

THE BIG WORLD OF TINY CREATURES

This show is full of experiments that make you ‘ooh’ and ‘ew!’ Learn about bacteria and their microbial mates - from vile viruses and funky fungi, to algae, archaea and protozoa. Discover why bacteria are the most important organisms on Earth and how they keep our world and bodies working, from the truly gross and terrifying to the simply amazing! From Steve Mould, author of The Bacteria Book.

4PM – 5PM

→ **SAT 16 MAR**

Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

Great for families

SHOW AND TELL: WORLD OF CONSERVATION

Join us on a journey of discovery during some punchy presentations from some of the best science presenters at UCCRI and beyond – as they show off their favourite things from the world of conservation.

4PM – 6PM

→ **SAT 16 MAR**

David Attenborough Building, New Museums Site, CB2 3QZ

MOONWATCH AT THE INSTITUTE OF ASTRONOMY

Join us and observe the moon with a range of historical and modern telescopes.

7PM – 9PM

→ **SAT 16 MAR**

Institute of Astronomy, Madingley Road, CB3 0HA

Great for families

X-RATED SCIENCE

Presented in partnership with TTP The Technology Partnership.

Ever watched a wildlife documentary, felt the emotion, witnessed the drama but left with the big question: I wonder how they ‘do’ it? Wonder no more. This scientifically accurate event pits wildlife experts against each other in the most unconventional game of *Would I lie to you*? ever. We can’t guarantee you’ll be impressed but we promise to discuss the things Attenborough won’t say on the telly! With Drs Ben Garrod, Jack Ashby, Matt Wilkinson, Helen Scales and Lizzie Daly.

7PM – 9PM

→ **SAT 16 MAR**

Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

For adults only

£5

“The Festival has exposed me to scientific facts, new ideas and discoveries and has helped me think differently about how we do things.”

Sun 17 Mar

WHAT A NERVE!
See science through art! Exhibition of artists exploring nerve structures, myelination and disease in response to stem cells and the work of the Wellcome-MRC Cambridge Stem Cell Institute. A Growing Art Partnerships event.

10AM – 5PM
→ SUN 17 MAR
Cambridge Union Society, 9A Bridge Street, CB2 1UB

EXPLORING THE SECRET LIVES OF OCTOPUSES
Octopuses are very smart, very strange animals. They have blue blood, three hearts and eight arms that think for themselves. Marine biologist Helen Scales is back to answer some big questions about these amazing animals. Why are octopuses so clever? Why do they live such short lives? And are octopuses really aliens?

10.30AM – 11.30AM
→ SUN 17 MAR
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Ideal for teenagers

SCIENCE ON SUNDAY: PUTTING THE CAMBRIDGE UNIVERSITY BOTANIC GARDEN ALPINE COLLECTION UNDER THE MICROSCOPE
Science on Sunday is a programme of informal monthly drop-in talks at the Botanic Garden. The series launches with Dr Raymond Wightman explaining how a research collaboration with the Garden on the alpine collection has yielded fascinating new insights into the inner workings of these plants.

11AM – 11.30AM
2PM – 2.30PM
→ SUN 17 MAR
Botanic Garden, 1 Brookside, CB2 1JE

Normal admission charge

HANDS-ON AT THE GUILDHALL: AUTISM FRIENDLY HOUR
For one hour, our Guildhall hands-on space is open to adults and children who have an autism spectrum condition and their families. Explore and discuss Cambridge science in a quieter and less-crowded space.

11AM – NOON
→ SUN 17 MAR
The Guildhall, Market Square, CB2 3QJ

DISCOVERIES IN THE MUSEUM
Can you discover a place that already had people living in it? Follow the trail through the Museum and find out about the travels of explorers of the past.

NOON – 4PM
→ SUN 17 MAR
Museum of Archaeology and Anthropology, Downing Street, CB2 3DZ

HANDS-ON AT THE GUILDHALL: SUNDAY SCIENCE
Join the Cambridge Science Festival at the Guildhall for another packed day of activities. See Saturday's entry for all the events taking place.

NOON – 4PM
→ SUN 17 MAR
The Guildhall, Market Square, CB2 3QJ

ANIMAL TOP TRUMPS
Who would win a fight between a rhino and a triceratops? Were dinosaurs the most exciting animals to ever roam the planet or has today's wildlife evolved beyond prehistoric creatures, adapting in new ways that make them the best? Lizzie Daly and Dr Ben Garrod take sides to see who is the coolest – dinosaurs or animals of today?

12.30PM – 1.30PM
→ SUN 17 MAR
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Great for families

THE MAGIC OF DISCOVERY
To celebrate its centenary, the Cambridge Pentacle Magic Club has teamed up with the Science Festival to present a magical journey through scientific discovery. It was Arthur C Clarke who said advanced technology is indistinguishable from magic. We hope to show that magic is out there as we break the laws of science in a mind-bending adventure through discoveries made at the University of Cambridge.

2PM – 3PM
6PM – 7PM
→ **SUN 17 MAR**
Cambridge Junction, Clifton Way, CB1 7GX
Great for families

£10

PLAYING GAMES LIKE A MATHEMATICIAN
Games are a fun pastime – but underlying them is often some mathematics, which you can use to make better decisions when playing. Join mathematician Katie Steckles to find out how thinking like a mathematician, looking for patterns and mathematical abstraction can improve your gameplay.

2.30PM – 3.30PM
→ **SUN 17 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Ideal for teenagers

NATURE, IMAGINATION, TECHNOLOGY: MERGING OUR LEFT AND RIGHT BRAINS
Fancy tapping into your left and right hemispheres to see science creatively? Hosted by the CUP Bookshop, this creative writing workshop draws on science and art to explore climate change.

4PM – 6PM
→ **SUN 17 MAR**
Cambridge University Press Bookshop, 1–2 Trinity Street, CB2 1SZ
For young people from 11 to 18 years.

DEMO DERBY!
An hour of the best demos from Cambridge and beyond. Join Dave Ansell and performers from across the Festival as they show off their favourite demonstrations. Which will be your favourite?

4.30PM – 5.30PM
→ **SUN 17 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS
Great for families

COLLISION
In this lecture-recital, composer Darren Bloom and physicist Joseph Davighi discuss how they collaborated to create a string quartet inspired by Carlo Rovelli's *Seven Brief Lessons on Physics*. The event concludes with a live performance of the work by the award-winning Piatti Quartet.

5PM – 6.15PM
→ **SUN 17 MAR**
The Old Labs, Newnham College, Sidgwick Avenue, CB3 9DF

SCIENCE FESTIVAL CHORAL EVENSONG AT GREAT ST MARY'S, THE UNIVERSITY CHURCH
Join Professor Alister McGrath, the Andreas Idreos Professor of Science and Religion at Oxford University, as he gives the address at this beautiful candlelit service. In his sermon he considers recent and possible future developments in our thinking about science and faith. Everyone, of all faiths and of no faith, is most warmly welcome.

5.30PM – 6.30PM
→ **SUN 17 MAR**
University Church, Great St Mary's, Senate House Hill, CB2 3PQ

Retiring collection

Week two

There is no need to **pre-book** events unless indicated by our booking icon

To pre-book, visit:
www.sciencefestival.cam.ac.uk
or call: 01223 766766

Mon 18 Mar

SO YOU WANT TO BE A SCIENTIST?

What does it take to become a scientist? Meet scientists and find out about their jobs, what inspired them and what qualifications they needed. Expect amazing demonstrations and lots of time for questions.

9.30AM – 1PM
→ **MON 18 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW
For year 9 and 10 secondary school pupils

PRIMARY ROCKET LAUNCHPAD

Primary school groups are invited to the Department of Engineering to explore 3D geometry. As a finale, we make paper rockets and launch them using compressed air. A well-made rocket will go as high as our roof!

10.30AM – NOON
1PM – 2.30PM
→ **MON 18 MAR TO WED 20 MAR**
Department of Engineering, Trumpington Street, CB2 1PZ
For year 5 and 6 primary school pupils

WHAT'S TRUE AND WHAT'S NEW

Walk with the Society of Cambridge Tourist Guides and discover where some of the really cool big ideas came from. Awesome breakthroughs, controversial light-bulb moments and explosive insights revealed!

11AM – 12.30PM
→ **MON 18 MAR TO FRI 22 MAR**
Meet outside The Guildhall, Market Square, CB2 3QJ

CAMBRIDGE GRAVITY LECTURE: SIR GREGORY WINTER

Presented in partnership with Cambridge Gravity

Sir Gregory Paul Winter presents this year's Gravity Lecture. Sir Gregory is a molecular biologist and 2018 Nobel Laureate best known for his work on developing technologies to make therapeutic monoclonal antibodies. His research has led to antibody therapies for cancer, rheumatoid arthritis and multiple sclerosis.

5.30PM – 6.30PM
→ **MON 18 MAR**
McGrath Centre, St Catharine's College, Trumpington Street, CB1 2RL

OPEN-ACCESS ESCAPE GAME

Navigate a web of fiendish puzzles and mind-boggling riddles to liberate the research that has been locked down at the University – all in under an hour! An escape adventure for teams of 3–8 players with the Office of Scholarly Communication.

5.30PM – 6.45PM
→ **MON 18 MAR**
WED 20 MAR
FRI 22 MAR
10.30AM – 11.45AM
12.30PM – 1.45PM
2.30PM – 3.45PM
→ **SAT 23 MAR**
Milstein Exhibition Room, Cambridge University Library, West Road, CB3 9DR

Feature Image
Fish specimens from the Beagle Voyage
Credit: Julieta Sarmiento Photography

DISCOVERIES LEADING TO NEW TREATMENTS FOR DEMENTIA

Giovanna Mallucci is Professor of Clinical Neurosciences and Associate Director of the UK Dementia Research Institute. She discusses how research is transforming our understanding of the cellular mechanisms that make brain cells go wrong in dementia and degenerative brain diseases, and how these insights may be translated into new treatments.

6PM – 7PM
→ **MON 18 MAR**
Babbage Lecture Theatre,
New Museums Site,
Downing Street, CB2 3RS

SHIMMER: RAINBOWS, SEQUINS AND PHYSICS

Discover more about the physics of colours in bubbles and butterflies with Dr Rox Middleton. Find out how animals use colours, and how scientists are inspired by nature to make new materials for the future of fashion and function. Everyone welcome to a talk full of glitz and science!

6PM – 7PM
→ **MON 18 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

WHAT WILL MY QUANTUM COMPUTER DO FOR ME?

You might have heard that scientists will soon be able to build quantum computers. But what exactly is a quantum computer? Is it just a super-fast version of a normal computer? What will it be good for? And most importantly, should you buy one? Mithuna Yoganathan provides the answers! Hint: don't put in your pre-order until you've seen this talk!

6PM – 7PM
→ **MON 18 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

ART & SCIENCE SOIRÉE

Biomakespace and Art & Science Soirée, together with SciArt in Cambridge and the SynBio SRI, invite creative thinkers and tinkerers to connect with scientists, engineers, artists and designers engaged in DIY science. Join us at the OtherSyde Bar for an exciting evening of speed-meets, sciart snap-talks, hands-on demos and unexpected encounters.

6.30PM – 8PM
→ **MON 18 MAR**
OtherSyde Bar,
The Engineer's House,
Cambridge Museum of Technology, The Old Pumping Station, Cheddars Lane,
CB5 8LD
For adults only

THE BIG FESTIVAL QUIZ

Sharpen your pencils, get out your mascots... It's time to test your general knowledge (with plenty of science thrown in).

7PM – 10PM
→ **MON 18 MAR**
Arts Picturehouse,
38–39 St Andrew's Street,
CB2 3AR
For adults only

HOW DO WE MEASURE QUALITY IN HIGHER EDUCATION?

Presented with the Cambridge Society for the Application of Research

As universities are held more accountable for the quality of their provision, how can research inform our thinking about how we measure quality in higher education? Professor Anna Vignoles explains all!

7.25PM – 9PM
→ **MON 18 MAR**
Wolfson Hall, Churchill College, Storey's Way,
CB3 0DS

£5 / CSAR members free
incl. refreshments

GUT REACTION

It's something that we all do, but no one talks about: emptying your bowels. Dr Ewan St John Smith and Dr James Hockley teamed up with DragonLight Films to produce a film that explores how gut function goes wrong and how scientists and clinicians are working to treat those affected. Discover more about your gut, a system as complex as your brain, and how it controls things we take for granted!

7.30PM – 9PM
→ **MON 18 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

QUANTUM COMPUTERS: THE ULTIMATE TOOLS FOR DISCOVERY

These novel machines, which fully harness the 'weirdness' of quantum mechanics, are supposed to soon outperform all classical computers and change the world. Dr Ulrich Schneider looks at the foundations of these claims, and discusses the current status and realistic future prospects of quantum computers. With Jesus College Intellectual Forum.

7.30PM – 9PM
→ **MON 18 MAR**
West Court, Jesus College, Jesus Lane, CB5 8BL

Tue 19 Mar

I WASN'T EXPECTING THAT!

What unexpected discoveries have been made and recorded in the pages of books and manuscripts at the University Library? This display reveals some remarkable finds spotted by readers and staff alongside world-changing scientific works.

4PM – 6PM
→ **TUE 19 MAR**
Milstein Seminar Rooms, Cambridge University Library, West Road, CB3 9DR

MICRO:BIT TREASURE HUNT

We're going on a treasure hunt! Join us for some coding fun with the micro:bit.

4PM – 6PM
→ **TUE 19 MAR**
Centre for Computing History, Rene Court, Coldham's Road, CB1 3EW
Ideal for children aged 8–14 years

£12 / £8

ESCAPE ROOMS: SAVE YOUR CELLS!

Your body's cells are threatened; can you get the message through to activate a counter-attack? Experience how cells communicate by recreating a signalling pathway that regulates how cells act and react. Enter the Babraham Institute's pop-up escape room, master laboratory techniques and solve scientific puzzles to untangle the mysteries to help your cells survive.

4.30PM – 5.30PM
5.30PM – 6.30PM
6.30PM – 7.30PM
7.30PM – 8.30PM
→ **TUE 19 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

£15 per team, 4–6 players

OBJECTS: CARRIERS OF KNOWLEDGE

What is this object? What is its value? Why should we care? A multidisciplinary panel invites you to join their discussions of objects relating to food security, as a way to better understand all aspects of this complex challenge. Presented by Cambridge Global Food Security IRC.

5.30PM – 6.45PM
→ **TUE 19 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

IMPROVING QUALITY AND SAFETY IN HEALTHCARE

THIS Institute Director Professor Mary Dixon-Woods looks at the challenges to improving quality and safety in healthcare and considers why it's so hard to answer the question: Does quality improvement actually improve quality? Dr Fiona Godlee, Editor in Chief of *The BMJ*, then leads an interview-style Q&A.

6PM – 7PM
→ **TUE 19 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

POLICING YOUR PROTEINS: HOW CELLS ENFORCE QUALITY CONTROL

Every cell needs a particular set of protein machines to do its work: intestinal cells send out digestive enzymes to consume food; cells of the pancreas put insulin into the bloodstream. Dr Liz Miller, MRC-Laboratory of Molecular Biology, studies how individual cells make sure that these protein machines are correctly assembled before sorting them to the correct place for their onward journey, a process known as protein quality control.

6PM – 7PM
→ **TUE 19 MAR**
Cambridge Academy for Science and Technology, Robinson Way, CB2 0SZ

TREE RINGS AT THE INTERFACE OF ARCHAEOLOGY, CLIMATOLOGY AND ECOLOGY

Professor Ulf Büntgen presents an introduction into modern tree-ring research, including wood anatomy, and discusses how different tree-ring archives and parameters can help to identify and shift research frontiers and cross disciplinary boundaries – not only within the natural sciences but also to the humanities.

6PM – 7PM
→ **TUE 19 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

DONATING TISSUE: WHAT DO PEOPLE WANT TO KNOW?

In this informal panel and Q&A session, we discuss the use of human tissue in research and where this research may lead, and hear the perspectives of patients and healthcare professionals on the current routes for tissue donation. Hosted by the Wellcome-MRC Cambridge Stem Cell Institute.

6PM – 7.30PM
→ **TUE 19 MAR**
St Barnabas Church, Mill Road, CB1 2BD

IMMUNOLOGY: THE FUTURE OF MEDICINE?

Cambridge Immunology Public Lecture

Understanding disease at the molecular level is key to the discovery of new targets that drive inflammation and autoimmune processes but what happens when the immune system hits the wrong target? Professor Clare Bryant and our panel of Cambridge immunologists discuss how understanding disease triggers may enable entirely new approaches to treating and potentially preventing disease.

6PM – 7.30PM
→ **TUE 19 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

MEET YOUR FRIENDLY NEIGHBOURHOOD CLIMATE SCIENTISTS

Join your local climate experts Drs Emily Shuckburgh, Heather Ford, Cameron Brick, Ella Gilbert and Dan Jones for a climate change conversation. Come and get personal with climate science!

6PM – 7.30PM
→ **TUE 19 MAR**
British Antarctic Survey, High Cross, Madingley Road, CB3 0ET

POLAR OCEAN: THE DEAD END OF PLASTIC DEBRIS
An estimated 80% of all the litter in our oceans is plastic, and a significant concentration of plastics debris is found in both polar oceans. The impact of this debris on the sensitive polar ecosystem could be profound. Pelagic marine ecologist Dr Clara Manno, British Antarctic Survey, explores the current research and existing situation in the polar regions.

6PM – 7.30PM
→ **TUE 19 MAR**
Scott Polar Research Institute, Lensfield Road, CB2 1ER

RELUCTANT FUTURIST
Presented with Cambridge Skeptics
Reluctant futurist Mark Stevenson takes us on a whistle-stop tour of the good, the bad and the ugly of the next 30 years. Old models for healthcare, education, food production, energy supply and government are creaking under the weight of modern challenges. How can we re-invent ourselves for the future?

7.30PM – 9PM
→ **TUE 19 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

WRITING THE ANTHROPOCENE: MEGAN HUNTER IN CONVERSATION
What would life be like after a climate catastrophe? Now that climate change is a reality too big to be comprehended by graphs and statistics alone, fiction is proving as important a medium as science in the environmental debate. For instance, in the certain event of rising sea levels, how do we write about and imagine humanity's second fall? With Jesus College Intellectual Forum.

7.30PM – 9PM
→ **TUE 19 MAR**
West Court, Jesus College, Jesus Lane, CB5 8BL

Wed 20 Mar

ANCIENT KNOWLEDGE AND MODERN SCIENCE: REDISCOVERING CHINA'S TERRACOTTA ARMY
Join Marcos Martinón-Torres, Pitt-Rivers Professor of Archaeological Science, for this look at the Terracotta Army. So many questions remain. How were knowledge, materials and workforce orchestrated to create something so large and sophisticated? Why are their bronze weapons still sharp and shiny? Archaeological science is beginning to provide the answers.

1PM – 2PM
→ **WED 20 MAR**
McDonald Institute for Archaeological Research, Downing Street, CB2 3ER

SMALL PAINTINGS, BIG DISCOVERIES: RECENT RESEARCH ON ISAAC OLIVER'S MINIATURES

The portrait miniature is a rare art form that was brought to perfection in Elizabethan and Jacobean England. Dr Paola Ricciardi discusses the work of Isaac Oliver from a technical angle as evidenced in works from the Fitzwilliam Museum miniatures collection.

1.15PM – 2PM
→ **WED 20 MAR**
Fitzwilliam Museum,
Trumpington Street, CB2 1RB

Admission by token, available from 12.45PM

THE NEUROSCIENCE OF OUT-OF-BODY EXPERIENCES

What happens in the brain during out-of-body experiences (OBEs)? Dr Jane Aspell, Anglia Ruskin University, discusses scientific explanations of OBEs, and describes why the science of OBEs can help us understand how the brain creates a 'self'.

4PM – 5PM
→ **WED 20 MAR**
Anglia Ruskin University,
East Road, CB1 1PT

ANDREW CHAMBLIN MEMORIAL LECTURE: PROFESSOR JOHN ELLIS

John Ellis is the Clerk Maxwell Professor of Theoretical Physics, King's College London. His research focuses on phenomenological aspects of elementary particle physics and connections with astrophysics, cosmology and quantum gravity. Much of his work relates to experiment: interpreting results of searches for new particles and exploring the physics that could be done with future accelerators.

5PM – 6PM
→ **WED 20 MAR**
Lady Mitchell Hall,
Sidgwick Avenue, CB3 9DA

ADOLESCENT MENTAL HEALTH: RESILIENCE AFTER CHILDHOOD ADVERSITY

Adolescence is characterised by marked cognitive, hormonal and neurodevelopmental changes as well as a rapid rise in the prevalence of mental health disorders. Around 45% of adolescent mental health problems are attributable to childhood adversity but fortunately not all who experience adversity develop psychopathology. Dr Anne-Laura van Harmelen discusses mechanisms that may aid resilient functioning in adolescents with a history of childhood adversity.

6PM – 7PM
→ **WED 20 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

ENGINEERING BIOLOGY EVERYWHERE: EXPANDING ACCESS TO THE MOST IMPORTANT TECHNOLOGY OF OUR AGE

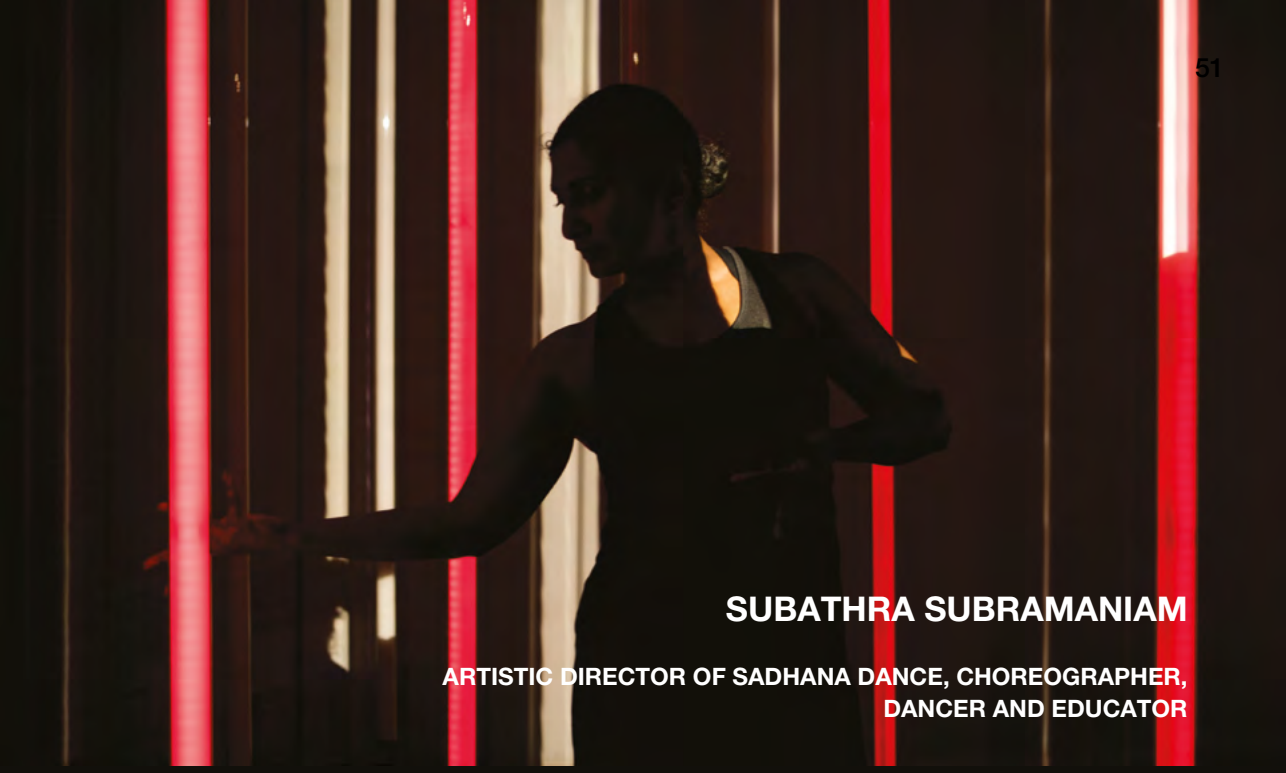
Biology is technology and it is key to a sustainable future for people and the planet. How can more people shape this future? Shuttleworth Fellow Dr Jenny Molloy explores how open-source technologies and community efforts are enabling biological research by more people in more places than ever before.

6PM – 7PM
→ **WED 20 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

FROM FIREFIGHTING TO A SYSTEMS APPROACH FOR HEALTH AND CARE IMPROVEMENT

Through stories of firefighting, beer and micromorts, Professor P John Clarkson explores the engineer's world of systems design and risk, and relates this to the development of a systems approach to service design and improvement in health and care.

6PM – 7PM
→ **WED 20 MAR**
Cambridge Academy for Science and Technology,
Robinson Way, CB2 0SZ



SUBATHRA SUBRAMANIAM

ARTISTIC DIRECTOR OF SADHANA DANCE, CHOREOGRAPHER, DANCER AND EDUCATOR

Attempt to address any aspect of mental health, especially when it involves young people and self-harm, and you can rapidly run into trouble. Prejudices, preconceptions... and precious little in the way of open, informed engagement.

Alongside my choreography I have worked regularly for over 10 years as a secondary school science teacher. Throughout this time I have watched, helped, and taught teenagers who struggle with mental health on a daily basis. Too often their problems are glossed over, marginalised as something affecting others and for others to deal with, rather than understood as affecting all of us and needing everyone to address. This conscious or unconscious tendency to look the other way arguably does more damage than the mental health issues themselves. A societal form of self-harm.

That's why I wanted not only to make Unkindest Cut, but make it to engage as wide an audience as possible. I set out to try to open out the conversation on mental health and young people beyond the usual suspects, and to encourage it to truly be a conversation, not a lecture. Dramatic, not didactic.

People will come to it from different places, they will go from it on their own individual trajectories. But rather than them leaving with a clearer understanding of my thoughts and reflections, the installation and performance provides everyone the space and time – and stimulation – to reassess and add to their own views and knowledge.

In order to expand and explore my own perspectives on this, I have collaborated closely with Dr Partha Banerjea, consultant child and adolescent psychiatrist at The Child and Adolescent Mental Health Services (CAMHS) in Southwark. He's based at the The Maudsley Hospital, the UK's largest mental health training institution in the UK, and I spent many hours there with him and his team sitting in on one to one meetings with patients and family therapy sessions. It was humbling, eye opening and often deeply moving.

I realised not only how complex and different each patient's story is, but how few clues there are on the surface to what lies beneath. Which is why everything unfolds inside a shipping container: from the outside they all look much the same.

But it's what's on the inside that counts.

RELATED EVENTS

UNKINDEST CUT: HARM AND HARMONY IN YOUR HEAD – PERFORMANCE **P15**
UNKINDEST CUT: HARM AND HARMONY IN YOUR HEAD – DISCUSSION **P16**
UNKINDEST CUT: HARM AND HARMONY IN YOURHEAD – INSTALLATION **P18**

TACKLING BRAIN TUMOURS: ADDRESSING ONE OF THE HARDEST CHALLENGES IN CANCER RESEARCH

Brain tumours are one of the hardest types of cancer to treat, and survival has barely improved over the last 40 years. Tackling brain tumours is a big challenge, but Cancer Research UK researchers in Cambridge are determined to improve the outlook for people who have this disease. Hear how our researchers are hoping to tackle this cancer from different angles.

6PM – 8PM
→ **WED 20 MAR**
St John's College Old Divinity School, All Saints Passage, CB2 1TP

DISCOVERING PLANETARY BOUNDARIES: KNOWN KNOWNS AND KNOWN UNKNOWNS

Researchers from the Global Sustainability Institute, Anglia Ruskin University, discuss the concept of planetary boundaries: how human activity impacts on the Earth as a complex system. They explore how risk and uncertainty can be incorporated into modelling to predict safe levels of change, while acknowledging the limits to our own understanding of how these factors can influence each other.

6.30PM – 7.30PM
→ **WED 20 MAR**
Anglia Ruskin University, East Road, CB1 1PT

KARATE KID VS ROCKY BALBOA: THE SCIENCE OF STRENGTH AND POWER

Dr Dan Gordon, Anglia Ruskin University, discusses the principles of skeletal muscle physiology and how mechanical and chemical events lead to the generation of force. He considers how training produces both gains in the size and speed of muscle action. He also addresses some of the perceived misconceptions about strength and power training through the appreciation of underlying muscle physiology.

7PM – 8PM
→ **WED 20 MAR**
Anglia Ruskin University, East Road, CB1 1PT

GENOMICS IN A JIFFY

In this fast-paced speed science social, up-and-coming scientists in the fields of genomics and big data from the Wellcome Genome Campus compete to enthral and inspire you with their science stories. Pride and prizes are at stake in this informal, friendly event!

7PM – 9PM
→ **WED 20 MAR**
The Michaelhouse Café, St Michael's Church, Trinity Street, CB2 1SU

POETRY: ON LOVE, DEATH ... AND STEM

Entertaining and thought-provoking poetry by two late Cambridge scientists and poets, astronomer Rebecca Elson and physicist and software designer Peter Howard. Readers: Anne Berkeley and Heather Howard.

7.15PM – 9PM
→ **WED 20 MAR**
The Locker Cafe, 54 King Street, CB1 1LN

LIVES OF STARS: ADVENTURES OUT OF THIS WORLD

Stars are the dynamo of the Universe, factory of its elements and driver of its rattling events. They live eventful lives then fade away and die, donating matter back to the Universe. How do we learn about these heavenly bodies and what secrets do they hide? That's a tale Dr Ghina Halabi, Institute of Astronomy, will tell on this stellar ride.

7.30PM – 8.30PM
→ **WED 20 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

"We learned so much and had fun, the perfect combination :)"

TRANSFORMING CANCER CARE
New approaches to prevention, diagnosis and treatment of cancer are growing rapidly and, while incidents of cancer will grow dramatically, it is likely that 3 in 4 people will live 10 years or more with the disease. Professor Sir Leszek Borysiewicz discusses how a transformation in our approach to diagnosis, treatment and care is necessary to deliver the benefits of science to most, if not all, cancer sufferers. Organised by the Wolfson College Science Society.

7.30PM – 8.30PM
→ **WED 20 MAR**
Lee Hall, Wolfson College, Barton Road, CB3 9BB

LOOKING INTO CAMBRIDGE'S FUTURE
Research Horizons Public Talk
What does the future hold for Cambridge? How will its economy grow, and will our housing and transport infrastructure be able to cope? Dr Ying Jin discusses to what extent we are able to predict the city's development, and Matthew Bullock and Dr Gemma Burgess discuss why these predictions matter for balancing economic success and social equality.

7.30PM – 9PM
→ **WED 20 MAR**
Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

THE ASTROHOLIC LIVE
Do you like science? Do you like cocktails? Of course you do! Come along and experience that and more at a recording of The Astroholic LIVE, where science, comedy and alcohol mix hilariously for your entertainment. Dr Alfredo Carpineti and Luís Costa da Silva are joined by two phenomenal Cambridge researchers for a very different kind of science evening!

8PM – 10PM
→ **WED 20 MAR**
Thirsty Cambridge, 46 Chesterton Road, CB4 1EN
For adults only

Thu 21 Mar

THE FUTURES OF SCIENCES
The Cambridge Philosophical Society was founded in 1819 for the purpose of promoting scientific inquiry. This two-day meeting, organised by Professor Simon Conway Morris, covering the Futures of Sciences, their different aspects and varied applications, celebrates the 200th anniversary of the Society.

1.15PM – 5.15PM
→ **THU 21 MAR**
9AM – 5.15PM
→ **FRI 22 MAR**
Department of Engineering, Trumpington Street, CB2 1PZ

MENDELEEV'S DREAM: EXPERIENCE THE PERIODIC TABLE THROUGH MUSIC!

As part of the celebrations for the International Year of the Periodic Table, we have devised a new piece of music that gets you in amongst the elements. Which is your favourite? Are you mad for magnesium? Crazy about carbon? Love lithium? In this unique musical experience, *Mendeleev's Dream*, you can sing or play your element as part of a vast musical ensemble, creating an elemental harmony.

5PM – 7PM
→ **THU 21 MAR**
McGrath Centre,
St Catharine's College,
Trumpington Street, CB1 2RL
For young people aged 8+

MENTAL HEALTH CONDITIONS ARE NOT SYNONYMOUS WITH FAILURE: A PERSONAL STORY WITH POPPY JAMAN OBE

16th Annual Disability Lecture

Poppy Jaman OBE is an internationally respected mental health advocate, national policy adviser and social entrepreneur who has played an instrumental part in making mental health a high priority for public and private sector employers.

5.30PM – 6.30PM
→ **THU 21 MAR**
St John's College Fisher Building, St John's Street, CB2 1TP

WATER, SOIL AND AIR: THE GOOD, THE BAD AND THE USEFUL

Meet the inventors who are developing cutting-edge, sustainable and low-cost technologies for the developing world. Discover how the Centre for Global Equality's Cultivator projects are using technology to provide clean drinking water to all, testing air quality and using the earth to cultivate the good, eliminate the bad and make use of the useful.

5.30PM – 7.30PM
→ **THU 21 MAR**
Emmanuel United Reformed Church,
72 Trumpington Street,
CB2 1RR

ANTIBIOTIC RESISTANCE AND THE BAD BUG CHALLENGE

Most of us have used antibiotics to fight an infection by a nasty bug and were happy that it worked. But the bugs are fighting back, or so it seems, making them potential winners in an ongoing rat race between us and them. Dr Hendrik van Veen discusses the ins and outs of antibiotic resistance in the hidden world of microorganisms. Includes historic facts, gloopy stuff and science in action!

6PM – 7PM
→ **THU 21 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

EINSTEIN, GENERAL RELATIVITY AND GRAVITATIONAL WAVES

Presented with the Cambridge Physics Centre

The discovery of gravitational waves is of the greatest significance for fundamental physics, astrophysics and cosmology. Professor Malcolm Longair describes the essence of what Einstein did, the way in which the general theory leads to the inevitability of black holes, the evidence for them, the nature of gravitational waves and the great importance of the recent LIGO results.

6PM – 7PM
→ **THU 21 MAR**
Cavendish Laboratory,
Department of Physics,
JJ Thomson Avenue, CB3 0HE

THERE IS NO PLAN(ET) B: A SURVIVOR'S GUIDE TO THE MAKE OR BREAK YEARS

Presented with Cambridge University Press

We all know deep down that these are the 'make or break' years for humanity and the planet, and that we cannot flee to another world: but what can any of us really do about it? Professor Mike Berners-Lee, Lancaster University, offers a big picture perspective on our biggest environmental and economic challenges and considers what we might do to help improve the lot of humanity on this – our only – planet.

6PM – 7PM
→ **THU 21 MAR**
Mill Lane Lecture Rooms,
8 Mill Lane, CB2 1RW

CERTAIN AND UNCERTAIN DISCOVERIES: STATISTICAL THINKING AT THE HEART OF SCIENCE

Pi is 3.1415···, Gravity is 9.8 m/s^2, smoking causes cancer, and brain training reduces the risk of dementia. Where in that list did you change from thinking yes, to may be, to really? Dr Simon White, MRC Biostatistics Unit, explores why some scientific findings are 'true' but others are open for debate. Is science broken, or have we all forgotten that the methods are as important as the results?

6PM – 7PM

→ **THU 21 MAR**

Cambridge Academy for Science and Technology, Robinson Way, CB2 0SZ

MAKESPACE: SIXTH BIRTHDAY SHOWCASE

Join us as we celebrate six years of making, inventing and collaboration at Cambridge's city centre makerspace. See products, prototypes and creations from science and engineering to crafts and arts, as well as the wide range of equipment on site that our 300 members have used to make them.

6PM – 8PM

→ **THU 21 MAR**

Makespace, 16 Mill Lane, CB2 1RX

FARMING OF THE FUTURE: ALTERNATIVE OPTIONS FOR AGRICULTURE AND CONSERVATION

Cambridge Natural History Society Talk

Abigail Burns, UNEP-WCMC, talks on future directions for global agriculture and conservation given the increasing pressures such as population growth and climate change. She focuses on the positive side of the ever-evolving debate around conservation within agricultural landscapes, as well as interesting technologies and solutions on the horizon.

6.15PM – 8.30PM

→ **THU 21 MAR**

David Attenborough Building, New Museums Site, CB2 3QZ

SALON: INNOVATE

Cambridge Junction presents a space for sharing new ideas between people from the arts, technology and academia. Includes short presentations, discussions and a chance to network with interesting and interested people on the theme of innovation.

6.30PM – 8PM

→ **THU 21 MAR**

Cambridge Junction, Clifton Way, CB1 7GX

Adults

£5 – includes drink

FROM STEEL TO STEM CELLS: THE FUTURE OF ORTHOPAEDIC SURGERY

Professor Andrew McCaskie is an orthopaedic surgeon with an interest in lower limb surgery. His research aims to develop innovative solutions, particularly regenerative, to benefit patients who have musculoskeletal disease, such as osteoarthritis. In his talk, Andrew considers the key advances in orthopaedic surgery and research that aim to repair or regenerate bone and joint tissues.

7.30PM – 8.30PM

→ **THU 21 MAR**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

MAKING ALGORITHMS TRUSTWORTHY

Algorithms are being increasingly deployed to make judgements about sensitive parts of our lives, but how do we check how their conclusions were arrived at, and if they are valid and fair? Professor David Spiegelhalter looks at efforts to make algorithms transparent and trustworthy, illustrated with explanation facilities on systems making predictions for people with cancer.

7.30PM – 8.30PM

→ **THU 21 MAR**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

THE PENTACLE CLUB

One hundred years ago, in May 1919, the Pentacle Club was founded by the eminent mathematician WW Rouse Ball. The Club consisted of members of Cambridge University who were interested in magic, the subscription was half-a-crown a term. Club members from the University would meet periodically to learn new magic techniques and to watch demonstrations by professional performers.

The annual shows in the 1920s gave the Club the opportunity to perform the latest illusions, such as sawing a woman in two. The programmes included magical playlets. The most famous of these - 'The Marvels of Modern Medicine' involved a golfer having his leg sawn off, and then drilled with holes before being replaced. Another patient was decapitated, the severed head smoking a cigarette with the aid of a pair of bellows before being restored. This sketch was to feature in many Pentacle shows during and after the Second World War, when it was called 'Bloodless Surgery'.

Over the decades, as today, the Club has performed in venues including theatres, May Balls, outdoor events, cabarets and birthday parties. In the 1960s, when Oxford University also had a magic club, there was an annual Oxford vs Cambridge magic competition in London, judged by The Magic Circle. Indeed, many Pentacle Club members are also members of the prestigious Magic Circle.

The Club admitted members from outside the University for the first time in 1963 and since then the membership comes mainly from Cambridge and the surrounding areas. Magic remains as popular as ever. It develops personal skills, as well as providing enjoyment for many. Our magical prediction is that the Club will be here for the next hundred years!

www.pentacleclub.com

RELATED EVENT
THE MAGIC OF DISCOVERY **P43**

Fri 22 Mar

THE SECRETS OF LIFE: SCIENTISTS, MATHEMATICIANS AND THE HUNT FOR ANSWERS

From evolution to the World Health Organization, from DNA editing to Nobel prizes, students and academics based at Christ's College have been at the forefront of scientific and mathematical discovery for four centuries. Explore historic and modern materials that tell the story of how science and maths have evolved.

10AM – 4PM
→ FRI 22 MAR
SAT 23 MAR
Old Library, Christ's College, St Andrew's Street, CB2 3BU

DARWIN'S MOST WONDERFUL PLANTS

Charles Darwin was a brilliant and revolutionary botanist with a particular interest in carnivorous and climbing plants and in pollination and the evolution of flowers. Author and scientist Dr Ken Thompson talks about his latest book, *Darwin's Most Wonderful Plants*.

2PM – 3.30PM
→ FRI 22 MAR
Brookside Classroom, Botanic Garden, 1 Brookside, CB2 1JE

JUNCTURES3

30 Bird supported by Cambridge Junction curate a selection of interruptions to alert and inspire you. Join us for a surprising evening of music, installations, interdisciplinary performances and transcultural interactions bridging art and science. The evening ends with a celebration of Persian New Year 1398.

4PM – 10PM
→ FRI 22 MAR
Cambridge Junction, Clifton Way, CB1 7GX

£15 / £12.50

TRANSFORMATION AND CONSERVATION: HOW BEHAVIOUR SHAPES EVOLUTION

Organisms show remarkable adaptations. Often, these adaptations are seen as responses that enable organisms to cope with the harshness of the environment. Professor Rebecca Kilner tells us about how behaviour itself can shape the course of evolutionary change. Organised by the Wolfson College Science Society.

5.45PM – 7PM
→ FRI 22 MAR
Lee Hall, Wolfson College, Barton Road, CB3 9BB

ON THE FUTURE: PROSPECTS FOR HUMANITY

Presented in partnership with TTP The Technology Partnership.

Our world is unsettled, rapidly changing and we face existential risks over the next century. Various outcomes are possible. Yet our approach to the future is characterised by short-term thinking, polarising debates, alarmist rhetoric and pessimism. Professor Lord Martin Rees argues that humanity's prospects on Earth and in space depend on our taking a different approach to planning for tomorrow.

6PM – 7PM
→ FRI 22 MAR
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

ORIGIN STORY: A MUSEUM OF ZOOLOGY LATE
Grab your 'spirits of wine' and journey back in time as we celebrate the 200th anniversary of the Cambridge Philosophical Society. Check out some of Darwin's experiments, get creative with Steampunk makes and explore the origins of the Museum of Zoology. In partnership with the Darwin Correspondence Project and Whipple Museum of the History of Science.

6PM – 9PM
→ **FRI 22 MAR**
Museum of Zoology, New Museums Site, Downing Street, CB2 3EJ
For adults only

FINDING BETTER MEDICINES
Currently on average, it costs over one billion pounds and takes 10 to 15 years to bring a new medicine to patients. Could collaboration between academia and industry at all stages of this process, from early research and development to clinical trials, lead to the discovery of medicines that are more effective and in a shorter time? Our panel of experts discuss how collaboration may lead to better outcomes for us all.

7.30PM – 9PM
→ **FRI 22 MAR**
Babbage Lecture Theatre, New Museums Site, Downing Street, CB2 3RS

Sat 23 Mar

DISCOVER ONE HEALTH RESEARCH AT THE VET SCHOOL
With growing threats from emerging diseases and antibiotic resistance, it is essential to study animal and human health together. Discover the cutting-edge biomedical research taking place in the Department of Veterinary Medicine through talks and hand-on activities for all ages.

10AM – 1PM
→ **SAT 23 MAR**
Department of Veterinary Medicine, Madingley Road, CB3 0ES

WONDER MATERIALS: GRAPHENE AND BEYOND
Get hands-on with a wide range of fascinating materials science, physics and chemistry experiments, and discover more about the research we do on graphene and other 2D materials at the Cambridge Graphene Centre.

10AM – 3PM
→ **SAT 23 MAR**
Centre for Advanced Photonics and Electronics, Electrical Engineering Division, 9 JJ Thomson Avenue, CB3 0FA

SCIENCESOURCE WORKSHOP: HOW DO SCIENTIFIC DISCOVERIES BECOME CLINICAL MEDICINE?
How do scientific discoveries become clinical medicine? Learn more about the process with this workshop led by ScienceSource, a ContentMine project. The workshop also explains how scientific facts can pass into Wikidata, Wikipedia's structured database.

10AM – 5PM
→ **SAT 23 MAR**
Makespace, 16 Mill Lane, CB2 1RX
For adults only

SCIENCE IN ART
Join artist Kelly Briggs to explore how the natural disintegration of artefacts can become inspiration for new artworks.

10.30AM – 12.30PM
→ **SAT 23 MAR**
Fitzwilliam Museum, Trumpington Street, CB2 1RB
This workshop is for children aged 8–12 years

£8

MAKING ALEXA SMARTER: AI AT SCALE
Dr Craig Saunders, Head of Applied Science, Amazon Alexa Knowledge, demonstrates the exciting challenges, combining language knowledge, research science and engineering, in developing the ground-breaking virtual assistant.

11AM – NOON
→ **SAT 23 MAR**
Isaac Newton Institute for Mathematical Sciences, 20 Clarkson Road, CB3 0EH

DISCOVERING THE CHEMENG AND BIOTECH DEPARTMENT!
Join chemical engineering and biotechnology researchers and students to discover how they take science from the fundamentals to application, and how long the journey is from idea to discovery. Build your own sensor, learn about the microbiome, explore the world of biomarkers and get to know our researchers through talks and speed sci-dating.

11AM – 2PM
→ **SAT 23 MAR**
Department of Chemical Engineering and Biotechnology, Philippa Fawcett Drive, CB3 0AS

SCHOOLS ZONE
Students from schools and sixth form colleges are the experts today, showing what they are investigating as part of their curriculum or after-school club. Don't miss these exciting demonstrations from the next generation of scientists, mathematicians and engineers.

11AM – 3PM
→ **SAT 23 MAR**
The Hauser Forum, 3 Charles Babbage Road, CB3 0GT

TURBO-POWER!
Ever wondered how jet engines can produce such awesome power? At the Whittle Laboratory, we work to make jet engines and turbo-machines more efficient. Join us for tours of our laboratories, see one of the world's first steam-turbine engines and discover how a turbo-machine works.

11AM – 4PM
→ **SAT 23 MAR**
Whittle Laboratory, Madingley Road, CB3 0DY

SKELETONS IN THE CLOSET AT ST JOHN'S
For hundreds of years, anatomists, archaeologists and artists have been interested in our bones. From Margaret Beaufort's *Book of Hours* to the photography of Samuel Butler, the special collections of St John's College include unique examples of this human fascination with skeletons. Explore medieval manuscripts, photographs and 'medicinal' animal bones in one of the oldest libraries in Cambridge.

11AM – 5PM
→ **SAT 23 MAR**
St John's College Old Library, St John's College, CB2 1TP

MATHS PUBLIC OPEN DAY
From Isaac Newton onwards, Cambridge has been associated with some of the most famous mathematicians in history. Join volunteer staff and students from the Faculty of Mathematics as they share their excitement of the subject through hands-on activities, games and demonstrations (featuring everything from custard to cosmology!) for visitors of all ages from 8 years through to adult.

NOON – 4PM
→ **SAT 23 MAR**
Centre for Mathematical Sciences, Wilberforce Road, CB3 0WA

DEPARTMENT OF MATERIALS SCIENCE AND METALLURGY

10AM – 4PM

→ **SAT 23 MAR**

Department of Materials Science and Metallurgy, 27 Charles Babbage Road, CB3 0FS

THE FINE PRINT: TOWARDS WEARABLE ELECTRONICS

Skin-like or epidermal electronics that can adhere seamlessly to human skin or even be inserted within the body are highly desirable for applications such as health monitoring. Materials science and metallurgy researchers present recent advances in additive manufacturing techniques, whereby functional nanomaterials can be directly 'printed' to create devices for wearable electronics.

10AM – 11AM

3D PRINTING WITH CHOCOLATE

Concrete is one of the most common materials used in building but contributes to 5% of the world's CO_2 emissions. 3D printing produces structures with less material and less waste, which can cut emissions from the concrete industry. This activity involves building a 3D printer and using it to print model buildings. Chocolate is used as a material, because it has a workable form that sets solid, much like concrete.

10AM – 1PM

COOL BALLOONS

What happens when you stretch a party balloon very fast? Its temperature increases! And what happens when you release the balloon after it has recovered its initial temperature? The balloon gets cold. You can easily detect this change of temperature with your lips, but materials science researchers give you a chance to observe it with an infrared camera. Probably the coolest event of the Science Festival!

10AM – 1PM

MATERIALS SCIENCE WORKSHOPS

Get hands-on with a wide range of fascinating experiments to explore the unique properties of novel materials, including materials for aerospace, information communication technologies, defence, energy and sustainability, and healthcare, as well as innovative techniques for materials characterisation, design and processing.

10AM – 1PM

INSIDE AN LED: BENEATH THE SURFACE OF A NOBEL-PRIZE-WINNING TECHNOLOGY

Light-emitting diodes (LEDs) based on gallium nitride are a revolutionary technology enabling energy-efficient solid-state lighting with huge potential to reduce greenhouse gas emissions. Materials science researchers delve beneath the surface of LEDs, to reveal the materials used to make them and how energy-efficient light emission is achieved.

11AM – NOON

ATTENTION TO DETAIL: CONSERVING THE HANDLEY PAGE VICTOR XH648

Originally manufactured as a strategic bomber, the Handley Page Victor was one of three V-bomber designs used by the RAF during the Cold War. The Large Object Conservation Team at the Imperial War Museum Duxford show how they use their engineering, conservation and scientific skills to ensure the long-term preservation of such a large object to the original specification for flight.

NOON – 1PM

CRAZY ABOUT COLOUR
What colours are there in white light? And in black ink? What happens when we mix colours? How does the colour of light affect what we see? Join materials science and metallurgy researchers to explore these and other questions about colour in this interactive workshop in which the science of colour is explored through play and fun experiments.

1PM – 2PM
2.30PM – 3.30PM

ENGINEERING ATOMS
Join the team from Engineering Atoms for an afternoon of hands-on activities to discover the materials used in jet engines, how we create them and what we can do to make them better! This year we also introduce our brand new 'Chocolate Impact Tester' for a delicious way of finding out how we test some key material properties.

1PM – 4PM

BETTER THAN BIONIC: BUILDING BETTER MEDICAL IMPLANTS
Have you ever wondered which materials are currently used in implants for regenerative medicine? Want to know more about the current technology used to produce more natural and functional prostheses and implants? Join us for a talk that takes you through the current applications of materials in medicine and showcases the cutting-edge work done every day in the Cambridge Centre for Medical Materials.

2PM – 3PM

COME FLY WITH US! A TOUR OF JET ENGINE MATERIALS
The jet engine is a tough engineering environment utilising the very best of what materials science has to offer. Efficiency requires engines to run hotter and faster, whilst remaining light. Materials science and metallurgy researchers focus on the key materials used throughout the jet engine and reveal what the future holds.

3PM – 4PM

INSTITUTE FOR MANUFACTURING

1PM – 5PM

→ **SAT 23 MAR**

Institute for Manufacturing, 17 Charles Babbage Road, CB3 0FS

LASER LAB TOURS

Get a glimpse of the latest laser technologies and find out how they are used in industry. Watch Institute for Manufacturing experts show you the amazing things that can be done with this technical kit. Take a look into the nano world, see the manipulation of microscopic things using 'laser tweezers' and explore the force of light.

LASER TIN CAN ALLEY

Fire your laser at our Institute for Manufacturing tin can alley to see who can knock down the most tin cans!

STEEL #SNAP

Have your group selfie etched onto steel using one of the Institute for Manufacturing's high-powered laser markers.

WHAT WOULD YOU USE THAT FOR?

Try some of the latest science-based products from local companies and win a prize for thinking of the most original ways to use them!

MANUFACTURING TOMORROW: HOW ENGINEERS ARE BUILDING THE FUTURE ... NOW!

Professor Tim Minshall explores how engineers are merging the physical and the digital worlds to change the way we make, buy and use everything from cars to planes, foods to medicines, phones to furniture, and so much more.

1.30PM – 2.30PM
3.30PM – 4.30PM

PECHA KUCHA CHALLENGE

Graduate students enrolled for a PhD in engineering take on the challenge of sharing their research with you in just 6 minutes 40 seconds, using the Pecha Kucha presentation method of 20 slides, each lasting 20 seconds. Will they succeed? Join us for just one or stay for as many as you like (they can be addictive!).

2PM – 4PM

MAXWELL CENTRE

1.30PM – 4.30PM
→ **SAT 23 MAR**
Maxwell Centre,
JJ Thomson Avenue,
CB3 0HE

CENTRE FOR DIGITAL BUILT BRITAIN: THE FUTURE OF CONSTRUCTION
Robotics, artificial intelligence, machine learning and new technologies are transforming the way we will build schools, homes and hospitals of the future. Visit the Centre for Digital Built Britain to discover how construction is going digital.

MIND THE (NANO) GAP: HOW NANOTECHNOLOGY OPENS UP NEW ROUTES FOR BIOSENSING AND HEALTHCARE
Researchers take you on a tour of nanoscience, seeing and manipulating objects at the tiniest of scales. Through demonstrations, discover how nano-sized gaps can help us control light, electrons or the flow of molecules to help us find out about our health and wellbeing.

NANOVIGNETTES
NanoVignettes is a series of microfilms presenting the latest research from the EPSRC Centre for Doctoral Training in Nanoscience and Nanotechnology, in an inventive and accessible visual format.

PEROVSKITE SOLAR CELLS AND LIGHTING FOR A FULLY SUSTAINABLE ENERGY FUTURE
See state-of-the-art approaches to low-cost solar energy and high-efficiency lighting solutions using metal-halide perovskite semiconductors. Join the Optoelectronics Group for live demonstrations and hands-on experiments that bring scientific concepts and challenges to life.

ANGLIA RUSKIN UNIVERSITY

2PM – 6.30PM
→ **SAT 23 MAR**
Anglia Ruskin University, East Road, CB1 1PT

THE SOUND OF SPACE EXPLORATION
Find out about the NASA Voyager mission and a unique piece of music created by translating 40 years of data into melodies using a process called sonification. Discover how music can provide a precious tool to explore science and be an amazing source of inspiring art. Presented by Dr Domenico Vicinanza, Anglia Ruskin University.

2PM – 3PM

HERE BE DRAGONS: THE WORLDS AND INSPIRATIONS OF URSULA K LE GUIN
Celebrating the works and ideas of the late Ursula K Le Guin, the most significant science fiction writer of her generation. With Dr Ghina Halabi, Robert Jones, Dr Una McCormack, Graham Sleight and Francis Spufford.

2PM – 3.30PM

WHAT KRAKENS LIE BENEATH?
Dr Gavan Cooke, Anglia Ruskin University, presents his cephalopod citizen science project that needs your help! The project gathers observations of cuttlefish, squid and of course octopuses in UK waters. He provides a background to the natural history and physiology of cephalopods, and shares some of the amazing findings resulting from public observations.

2PM – 3.30PM

LISTENING TO THE HUMAN BODY MOVING
Dr Domenico Vicinanza, Anglia Ruskin University, shows how to create music from dance, using sensors to capture human movements and then turn them into melodies using microcontrollers.

3PM – 4PM

BIBLIOTHERAPY FOR WELLBEING: POETRY AND PROSE AS PROZAC?
Bibliotherapy can be traced back to the ancients; Greeks, Romans and Egyptians all used reading to improve mind and morals. Our panel discusses the benefits of reading for sufferers of depression, examining how bibliotherapy has been employed; from WW1 to ongoing academic research and outreach programmes.

4PM – 5PM
For adults only

BURGERS, BACTERIA AND HEART DISEASE: MAKING SENSE OF THE PROCESSED FOOD DEBATE
Dr Clett Erridge, Anglia Ruskin University, explores some of the latest scientific discoveries that are making unexpected connections between the bacteria that grow on our foods and our risk of developing heart disease and type 2 diabetes.

4PM – 5PM

"Everything about this speaker and their talk was fantastically good!"

COSMIC QUEST: FROM BABYLON TO THE BIG BANG

Spanning over 40,000 years of astronomy, this lavish presentation features the personalities – including poet Omar Khayyam and golden-nosed nobleman Tycho Brahe – who have laid bare the mysteries of the Universe. With Professors Heather Couper and Nigel Henbest, Fellows of the Royal Astronomical Society. Presented with the Centre for Science Fiction and Fantasy at Anglia Ruskin University.

4PM – 5PM

ATTRACTION EXPLAINED: THE SCIENCE OF HOW WE FORM RELATIONSHIPS

Can science explain how we form relationships? Professor Viren Swami, Anglia Ruskin University, looks at how factors such as geography, appearance, personality and similarity affect who we fall for and why.

5.30PM – 6.30PM

SUGAR AND SPICE AND ALL THINGS NICE: A JOURNEY INTO TASTE SENSORS IN THE BODY

Dr Havovi Chichger, Anglia Ruskin University, delves into the weird and wonderful locations in the body that can taste, and considers how and why tissues and organs, such as our kidneys and lungs, can sense sweet and bitter substances. She discusses what this means in relation to our diet and health.

5.30PM – 6.30PM

OPEN DAY AT THE CAVENDISH LABORATORY

Physics talks, experiments, demonstrations, our pop-up planetarium and CHaOS! Join us at the Cavendish Laboratory for Festival favourites and interactive activities for all ages. Visit outreach.phy.cam.ac.uk/scifest for more information.

1PM – 4.30PM
→ **SAT 23 MAR**
Cavendish Laboratory, Department of Physics, JJ Thomson Avenue, CB3 0HE

MATHS VS SPORT

How do you take the perfect penalty kick? Where is the best place in the world to attempt a world record? What is the limit of human endurance? Maths has all of the answers, and Dr Tom Crawford tells you how you can use it to be better at sports (results may vary!).

2.30PM – 3.30PM
→ **SAT 23 MAR**
Cavendish Laboratory, Department of Physics, JJ Thomson Avenue, CB3 0HE
Great for families

NAUGHTY NUMBERS AND SHABBY STATISTICS IN THE NEWS

We are all familiar with exaggerated media stories about the risks of daily life and hearing numbers being used to score points in arguments rather than genuinely inform the public. Join Professor David Spiegelhalter to explore what it means to communicate statistical evidence in a trustworthy way, illustrated with some of the worst, and best, media stories.

2PM – 3PM
→ **SAT 23 MAR**
Centre for Mathematical Sciences, Wilberforce Road, CB3 0WA

A QUESTION OF (BITTER) TASTE!

A hands-on masterclass for adults at Biomakespace, covering a range of molecular biology techniques to teach genetics. Using your own DNA and cutting-edge laboratory equipment, discover whether your version of a bitter taste receptor gene makes you a super-taster or a non-taster.

2PM – 6PM
→ **SAT 23 MAR**
Biomakespace, Biomedical Innovation Hub, Clifford Albutt Building, Cambridge Biomedical Campus, Hills Road, CB2 0AH
For adults only

£20

OPEN AFTERNOON AT THE INSTITUTE OF ASTRONOMY

The Institute of Astronomy opens its doors for an afternoon of hands-on activities, demonstrations, talks and displays all around our lovely wooded site. Meet the scientists and the telescopes, and learn more about both astronomy and the research we do.

2PM – 6PM
→ **SAT 23 MAR**
Institute of Astronomy, Madingley Road, CB3 0HA

ENSEMBLES AND EMBRYOS

Music is artistic, biology is disciplined. Right? Explore the extraordinary parallels between making music and making an embryo in this interactive performance with Eva Higginbotham and Adam McDonagh, featuring live music and stories of the beginning of life.

4PM – 5PM
→ **SAT 23 MAR**
The Old Labs, Newnham College, Sidgwick Avenue, CB3 9DF

FAMILY GAMING NIGHT
An evening of video gaming for all the family! Includes games that everyone can play, from retro classics like Pac-Man, Space Invaders and Tetris, through to modern examples like Wii, PS3, Xbox 360 and Xbox One. It's a great chance for kids and parents to share experiences, compete against each other and talk about how technology and gaming have changed over the years.

6PM – 10PM
→ **SAT 23 MAR**
Centre for Computing History, Rene Court, Coldhams Road, CB1 3EW
Great for families

£8 / £6 / £24

GLUING THE RAINBOW BACK TOGETHER PROPERLY
Evidence-based poetry from scientist and Cambridge poetry slam champion Dr Robin Lamboll. The poems explore the web of life and human existence through facts, puns and word-games. Includes opportunities for conversation about the issues raised during the show.

7.30PM – 8.30PM
→ **SAT 23 MAR**
Cambridge Unitarian Church Hall, Emmanuel Road, CB1 1JW

Donations welcome

Sun 24 Mar

MEET THE BIOMAKERS
Biomakespace is a new community laboratory for Cambridge, enabling people who have a curiosity for engineering with biology to collaborate and learn together. If you are interested in building sensors with DNA, printing cells or building microscopes, meet the biomakers and find out more!

NOON – 4PM
→ **SUN 24 MAR**
Biomakespace, Biomedical Innovation Hub, Clifford Allbutt Building, Cambridge Biomedical Campus, Hills Road, CB2 0AH

CAMBRIDGE ACADEMY FOR SCIENCE AND TECHNOLOGY

11AM – 4PM

→ **SUN 24 MAR**

Cambridge Academy for Science and Technology, Robinson Way CB2 0SZ (close to the junction of Robinson Way and Long Road),

AWESOME ORGANS

Can new technology help save lives by increasing the number of organs available for transplantation? Join researchers from the NIHR Blood and Transplant Research Unit in Organ Donation and Transplantation to find out, plus try your hand as a surgeon and get your brain cells buzzing with our awesome organs quiz.

CAMBRIDGE ACADEMY FOR SCIENCE AND TECHNOLOGY

Cambridge Academy for Science and Technology is a state-of-the-art Academy School dedicated to educating the next generation of Britain's scientists, technicians, engineers and programmers. See the College's facilities, find out about its innovative curriculum and roll up your sleeves and experience the excitement of science in our challenge labs.

CAMBRIDGE AMBULANCE STATION

Join the team for resuscitation and immobilisation demonstrations, get a closer look at kit and equipment, and look around an ambulance.

DIABETES RISK FACTORS: CAN WE TELL YOUR HEALTH FORTUNE?

Join scientists from the MRC Epidemiology Unit to learn how measuring the things that may influence our risk of developing type 2 diabetes helps us discover how to prevent it.

DISCOVER DNA

Ever wondered how your DNA differs from that of a chimpanzee or even a flesh-eating microbe? Well, now you can with the GSK Clinical Unit, Cambridge.

DISCOVER THE WORLD OF CANCER RESEARCH

Join scientists from the Cancer Research UK Cambridge Institute, MRC Cancer Unit and Hutchison/MRC Research Centre to discover how cancer develops, grows and spreads. Put on a lab coat and get hands-on with a range of activities to explore the different lab skills required for cancer research.

DISCOVERING FORMULATION

Join MedImmune and AstraZeneca scientists to discover how we can change the viscosity of our injected medicines so that they are easier to use. Can you find the best excipient?

DISCOVERING THE MECHANISM OF ENERGY PRODUCTION IN MITOCHONDRIA

Mitochondria are the powerhouses of our cells. Their main function is metabolic energy conversion using enzymes in the electron transport chain and ATP synthase. Dysfunction in this system is the cause of the most frequent inborn errors of metabolism. MRC Mitochondrial Biology Unit researchers showcase their research towards discovering the causes of mitochondrial disease in the quest for future therapies.

DISCOVERING THE SECRET LIVES OF CELLS
Join researchers from the Cambridge Institute for Medical Research to unravel the mysteries of cells! Discover how we use microscopes to follow dynamic cell behaviours, and how this can help us understand what goes wrong in disease.

FROM STEEL TO STEM CELLS: THE FUTURE OF ORTHOPAEDIC SURGERY
Discover what trauma and orthopaedic surgeons and scientists do, in operating theatres and in research laboratories, to keep your joints moving.

GENOMIC REVOLUTION: IT'S IN OUR DNA
How can we decode our personal genome? Learn through a series of fun games and activities how next-generation DNA sequencing combines engineering, chemistry, genetics and informatics to revolutionise the way we diagnose disease.

HOW CAN BLOOD DONATIONS BE USED IN RESEARCH?
The Blood and Transplant Research Unit in Donor Health and Genomics is dedicated to discoveries and advances in the field of blood research. Find out about blood groups, the blood donation process and what we're learning to benefit the health of the UK population.

HUMAN RESEARCH TISSUE BANK
What do samples of human tissue look like under the microscope? Discover what happens in a tissue bank, and have a go at preparing a microscope slide of human tissue.

HYPERTENSION AWARENESS
High blood pressure or hypertension rarely has noticeable symptoms but if left untreated it increases your risk of serious problems such as heart attacks and strokes. Find out what hypertension is and what type of lifestyle can help us avoid it. We will also take blood pressure measurements for anyone interested.

IMMERSIVE TECHNOLOGIES AND GAMING FOR A HEALTHY BRAIN
Are you ready to immerse yourself into another reality? Join the NIHR Brain Injury MedTech Co-operative for an exciting virtual experience designed to challenge your memory, concentration and reasoning abilities, and see if it is possible to train your attention and memory.

INSPIRING THE NEXT GENERATION OF SCIENTISTS
Abcam researchers present a collection of hands-on activities for children (and adults, of course!) to bring science to life.

INTENS AND STEMCELL: LEARN ABOUT MINI-ORGANS AND STEM CELLS!
Learn about the creation of mini-organs from stem cells, see the tools and gadgets used in the lab, meet our scientists and discover how stem cells differentiate into various organs in the body.

INTRODUCING THE CAMBRIDGE BIORESOURCE
Find out about the Cambridge BioResource and what we do. Pop into our mobile unit and take part in our research!

MEET THE SCIENTISTS
Pop into our science booth and have a chat with our scientists about their research!

MISSION POSSIBLE WITH NIHR CAMBRIDGE BRC!
Grab your research passport and join fellow travellers on a voyage of discovery around the NIHR Cambridge Biomedical Research Centre. Your mission: find ten medical discoveries made on site by our researchers – including the artificial pancreas to control blood sugar and the pill on a string to detect throat cancer.

NHS BLOOD AND TRANSPLANT
Every day thousands of people's lives are saved or improved thanks to the generosity of blood donors. Find out how we use blood to treat different conditions, and how you can become a blood donor yourself.

PAIN AND BRAINS!
How do we feel pain? How do painkillers work? How are potential new painkilling medicines tested? Discover some of the answers by taking the cold pressor test with scientists from Mundipharma. Then make one of our (in)famous brain hats to wear with pride!

RISING STARS
Meet our scientific stars of the future as they introduce you to their research, and be the first to try out their new hands-on activities.

ROYAL PAPWORTH HOSPITAL PREVIEW TOURS
Don't miss this special opportunity to look around the new state-of-the-art Royal Papworth Hospital ahead of its opening on the Cambridge Biomedical Campus in April.

SEE YOUR CELLS
Discover the hidden beauty of the microscopic world with MRC Laboratory of Molecular Biology scientists. See your own cheek cells and test your observation skills with our microscope-based detective game.

STEM CELL ROBOTS
Meet scientists from the Cambridge Stem Cell Institute and explore how stem cells can be programmed to develop into different cell types. Our fantastic stem cell robots are waiting to be played with!

SUGAR SHOCK!
Do we decide what we eat? Join the Behaviour Change by Design team, and take part in our surprising tasks that teach us about how the environment around us influences how much sugar the nation eats.

TAKING MEDICATION: DISCOVERING YOUR FÊTE
Come along to our family-friendly fête to discover why some people struggle to take their medication(s) as prescribed and what the Department of Public Health and Primary Care is doing to support them.

TEDDY BEAR HOSPITAL
Do you have a poorly teddy? Does it have a broken bone, a headache or even a broken heart? Bring your teddy bear (or other special cuddly friend) for a consultation with our student doctors.

THE COLOURFUL WORLD OF MICROBIOLOGY
Bugs, germs, bacteria, viruses, parasites and fungal infections – how Public Health England East identifies what might be making us feel ill. Interactive, fun and even a bit messy!

TLC FOR TEETH, GNASHERS, IVORIES
Our teeth are amazing parts of our anatomy and sometimes overworked and underloved! Meet Samantha Glover, Dental Programme Manager, Public Health England East, for a chat and lots of interactive fun to get your teeth into!

TRANSLATIONAL RESEARCH: FROM BENCH TO BEDSIDE
Have you ever wondered how scientists develop drugs? Or are you a student who has an interest in clinical science and wants to find out more? Join our MPhil students as they journey from the lab to the clinic.

VISIT A REAL OPERATING THEATRE OR MORTUARY
Scrub up like a surgeon and learn about the team and equipment that make safe operations possible, or meet mortuary staff for a guided tour of a working mortuary.

"Absolutely first rate and has given me material to enhance my A level teaching."

YOUR IMMUNE ARMY: DISCOVER HOW YOUR IMMUNE SYSTEM WORKS
Every day your immune system is busy protecting you from the thousands of germs around you that can make you sick. It does its job so efficiently that you don't even notice that it is at work. Join Cambridge Immunology scientists and find out how your immune system works.

MASTERING MEMORY
Join Ginny Smith to find out what happens in the brain when we learn and create memories, and why we shouldn't always trust everything we remember! Using research from psychology and neuroscience, and quizzes and games, Ginny shares tips and tricks to help everyone make the most of their memory.

11.30AM – 12.30PM
Ideal for teenagers

DEPLOY: LAB IN A TENT
DEPLOY: Diagnostics to Empower Pathogen-detection in a LOw-income countrY is a mobile diagnostic laboratory in a tent that will be deployed in Sierra Leone and used to identify of cases of malaria and other vector-borne diseases. Meet the team and hear how their research aims to help stop the spread of infectious diseases.

1.15PM – 2PM

FANTASTIC BEASTS AND WHAT NOT TO CATCH FROM THEM
There are over 200 zoonotic diseases – infections caused by viruses, bacteria, parasites, fungi or prions that are transferred directly or indirectly to humans from animals. Join veterinary and clinical academics, a government health protection specialist and a vet as they bust myths about diseases we can contract from (real) animals.

2.15PM – 3PM
Great for families

WHY VIRTUAL REALITY CAN BE A BRAIN HEALTH GAME CHANGER
AI and VR promise to be game changers for the assessment and rehabilitation of traumatic and acquired brain injuries. The NIHR Brain Injury MedTech Co-operative brings together patients, carers, inventors, industry, clinical researchers and the NHS to translate this promise into useful technologies.

3PM – 4PM

THE ORIGINS OF CANCER: WHAT'S IN OUR GENES AND WHAT ISN'T?
Cancer will affect about one in three humans at some point in their lives. Professor Ashok Venkitaraman talks about how faults in certain genes can increase the risk that a person develops cancer, and what we are beginning to understand about how non-genetic factors can change this risk.

3.30PM – 4.15PM

CANCER RESEARCH UK, CAMBRIDGE INSTITUTE

11AM – 4.15PM

→ **SUN 24 MAR**

Cancer Research UK, Cambridge Institute, Li Ka Shing Centre, Robinson Way, CB2 0RE

DEPLOY: LAB IN A TENT

DEPLOY: Diagnostics to Empower Pathogen-detection in a LOw-income countrY is a mobile diagnostic laboratory in a tent. Meet the team and take a tour through the tent to see how the lab will operate in the field.

MOLECULAR MIX AND MATCH: DESIGNING AND MAKING NEW MEDICINES

Presented with Astex Pharmaceuticals

Through a series of short, interactive presentations, Astex Pharmaceuticals scientists take you on a journey into their 'molecular mix and match' approach to the discovery of new medicines. Stick around after the talks to meet the scientists!

11.15AM – 12.45PM

"A great experience for everyone 11/10!"

THE CELL: A LIVING COMPUTER IN A DROPLET OF WATER

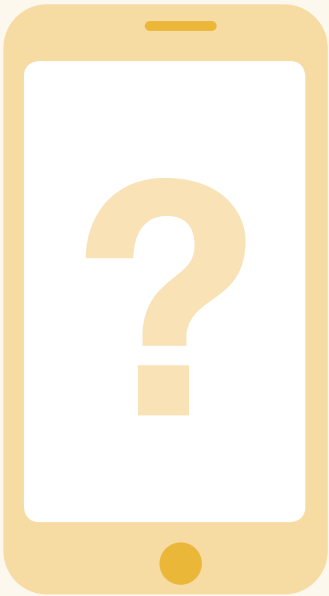
When to feed, to migrate, to die? At any moment, each of the three trillion cells making up our bodies takes decisions, and our lives depend on every cell taking the right decision at the right time. Dr Alessandro Esposito explores how the cell, a tiny droplet of water, takes decisions.

1.15PM – 2PM

ARTIFICIAL-INTELLIGENCE-ASSISTED DISCOVERY IN THE BATTLE AGAINST CANCER AND OTHER DISEASES

Rapid advances in 21st century biomedicine are generating vast amounts of data that can help us better understand and discover treatments for complex diseases like cancer. Dr Shamith Samarajiwa focuses on how the necessity to interpret these biomedical big data has lead to the development of data science and artificial intelligence technologies.

2.30PM – 3.15PM



CAN SMARTPHONE APPS HELP PEOPLE CHANGE THEIR BEHAVIOUR?

Despite frequent adverse publicity, mobile phones can be a force for good. Professor Stephen Sutton describes research on novel ways of using smartphone apps to help people make positive lifestyle changes such as quitting smoking and eating a healthier diet.

3.30PM – 4.15PM

SUNDAY PAPERS LIVE

Imagine the perfect social Sunday: great food, newspapers and Bloody Marys, then add some science! Sunday Papers Live returns to the Science Festival, bringing the broadsheets to life, section by section, with speakers, entertainers, creative activities, a guided walk, and food and drink.

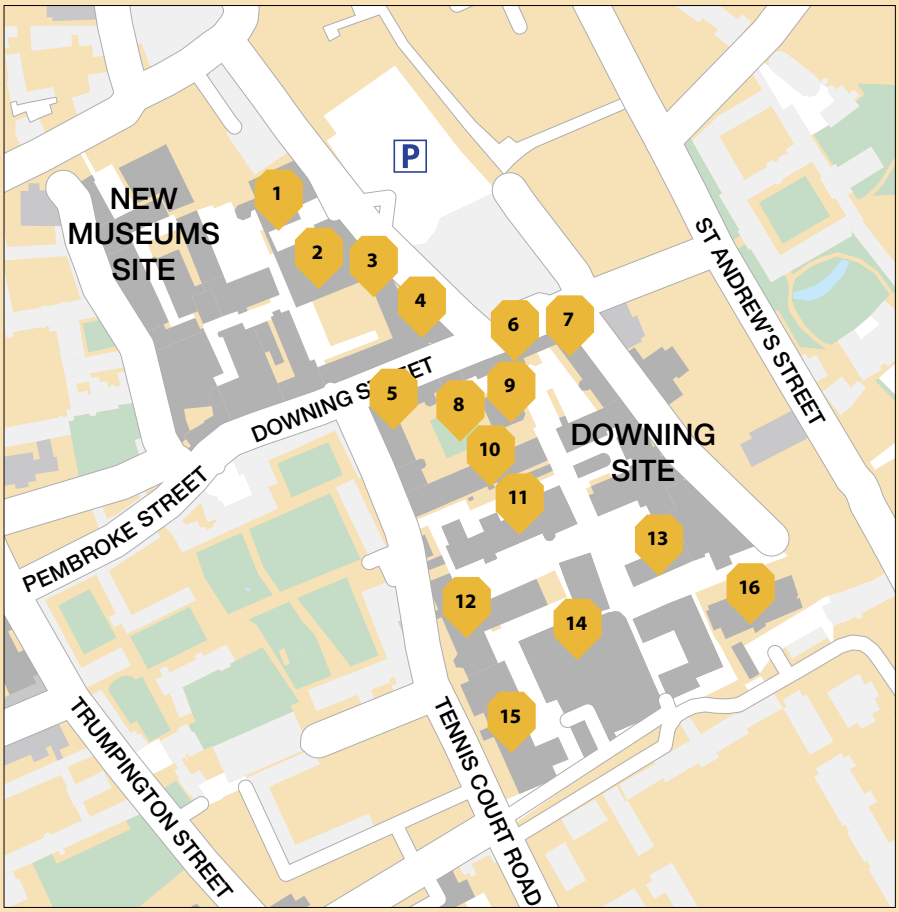
This special science edition aims to offer a thought-provoking and enjoyable Sunday where you can relax (bring your slippers!) and engage with current science topics.

NOON – 6PM
→ **SUN 24 MAR**
Cambridge Wine Merchants Wine Bar,
University Centre, Granta Place, CB2 1RU

Families with children over 12 years old welcome
Price does not include food and drink

£15 / £10 12–16 yrs

Downing and New Museums Sites



1 Babbage Lecture Theatre

2 David Attenborough Building

3 Museum of Zoology

4 Department of Zoology

5 Museum of Archaeology and Anthropology

6 Sedgwick Museum of Earth Sciences

7 Department of Earth Sciences

8 Marquee on the lawn

9 McDonald Institute of Archaeological Research

10 Department of Plant Sciences

11 Department of Genetics

12 Department of Biochemistry

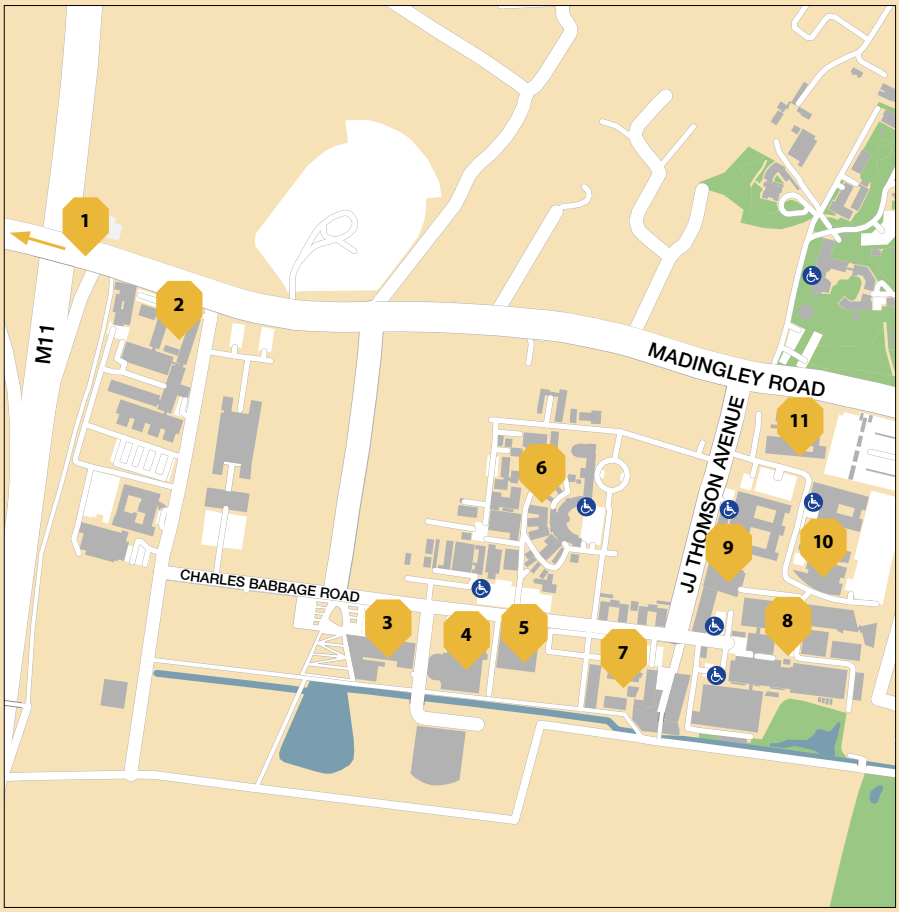
13 Department of Psychology

14 Department of Physiology, Development and Neuroscience

15 Department of Pathology

16 Department of Geography

West Cambridge Site



1 Institute of Continuing Education

2 British Antarctic Survey

3 Department of Materials Science and Metallurgy

4 Department of Chemical Engineering and Biotechnology

5 Institute of Manufacturing

6 Department of Veterinary Medicine

7 Hauser Forum

8 Cavendish Laboratory, Department of Physics

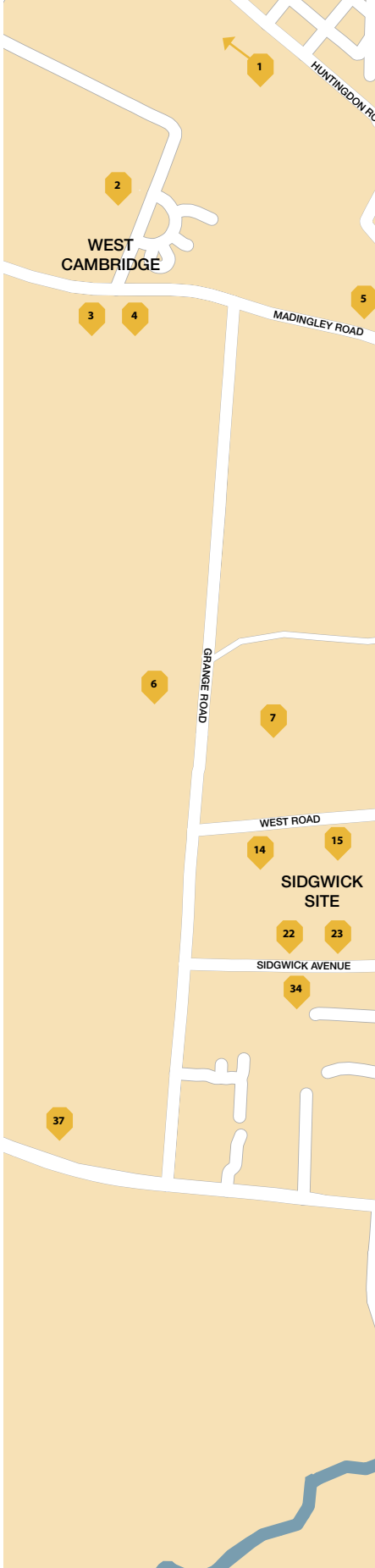
9 Maxwell Centre

10 Centre for Advanced Photonics and Electronics (CAPE)

11 Whittle Laboratory

12 Institute of Astronomy

15	Alison Richard Building	T	S	Li	
54	Alliance Française Cambridge	PA			
43	Anglia Ruskin University	T	S	Li	I
38	Arts Picturehouse	T	S	Li	I
60	Babraham Institute	T	S	Li	I
53	Botanic Garden	T	S		
58	Cambridge Junction	T	S	Li	I
26	Cambridge Museum of Technology	T	S		
9	Cambridge Regional College	T	S	Li	I
59	Cambridge Science Centre	T	S		
12	Cambridge Union Society	PA			
31	Cambridge Unitarian Church Hall	T	S		
7	Cambridge University Library	T	S	Li	I
17	Cambridge University Press Bookshop	S			
42	CB2 Café	T	PA		
27	Centre for Computing History	T	S		
3	Centre for Mathematical Sciences	T	S	Li	I
25	Christ's College	T	S	PA	
2	Churchill College	T	S	PA	
50	Department of Chemistry	T	PA		
47	Department of Engineering	T	S	Li	
36	Emmanuel United Reformed Church	PA			
41	Espresso Library	T	S	I	
21	Faculty of Law	T	S	Li	I
39	Fitzwilliam Museum	T	S		
1	Girton College	T	S		
28	Grand Arcade	T	S	Li	I
18	Great St Mary's Church	T	S	I	
48	Gurdon Institute	T	S	Li	
40	Henry Wellcome Building	T	S	Li	
49	Hughes Hall	T	S		
4	Isaac Newton Institute for Mathematical Sciences	T	S	Li	I
13	Jesus College	T	S	Li	I
44	Judge Business School	T	S	Li	
22	Lady Mitchell Hall	T	S	Li	I
5	Lucy Cavendish College	T	S	Li	
32	Makespace	T	S		
16	Michaelhouse Cafe	T	S	Li	
33	Mill Lane Lecture Rooms	T	S	Li	
56	MRC Cognition and Brain Sciences Unit	T	S	Li	I
23	Museum of Classical Archaeology	T	S	Li	
34	Newnham College	T	S		
30	Queens' College	PA			
6	Robinson College	T	S	Li	
57	Sainsbury Laboratory	T	S	Li	I
55	St Barnabas Church	T	S	I	
29	St Catharine's College	T	S	I	
11	St John's College	T	S	Li	I
52	St Paul's Church	T	S		
46	The Blue Moon Pub	PA			
24	The Guildhall	T	S	Li	I
19	The Locker Cafe	S			
51	The Polar Museum	T	S	Li	
8	The Portland Arms	PA			
10	Thirsty Cambridge	T	S		
35	University Centre	T	S	Li	
45	Wellcome-MRC Cambridge Stem Cell Institute	T	S	Li	
20	Wesley Methodist Church	T	S	I	
14	West Road Concert Hall	T	S	I	
37	Wolfson College	T	S	Li	




JESUS GREEN
MIDSUMMER COMMON
CHESTERTON ROAD
CASTLE ST
MAGDALENE ST
BRIDGE ST
TRINITY STREET
JESUS LANE
NEWMARKET ROAD
KING STREET
SIDNEY STREET
CHRIST'S PIECES
TRINITY LANE
THE BACKS
KING'S PARADE
BUS STATION
NEW MUSEUMS SITE
ST ANDREW'S STREET
DOWNING STREET
PARKSIDE
EAST ROAD
DOWNING SITE
PARKER'S PIECE
QUEEN'S ROAD
SILVER STREET
TRUMPINGTON ST
REGENT STREET
GONVILLE PLACE
MILL ROAD
NEWNHAM ROAD
LENSFIELD ROAD
FEN CAUSEWAY
HILLS ROAD
TRUMPINGTON ROAD
BATEMAN STREET
STATION ROAD
TRAIN STATION
BOTANIC GARDEN
BROOKLANDS AVENUE
CAMBRIDGE BIOMEDICAL CAMPUS

For enquiries or to pre-book, visit:
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or call: 01223 766766

Bookings open:
Mon 11 Feb 2019

Lines open:
11AM – 3PM
Mon – Fri

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UNIVERSITY OF CAMBRIDGE

CAMBRIDGE SCIENCE FESTIVAL

Cover Image
Reverend Professor John Stevens Henslow (1796–1861)
Geological map of Anglesey 1822
Cambridge Philosophical Society

Perhaps better known as the mentor and teacher of Charles Darwin, John Stevens Henslow played a pivotal role in the development of geological mapping. Henslow's map of Anglesey, which features as our cover image, is one of the first detailed geological maps of the UK. It was published in Volume One of the Transactions of the Cambridge Philosophical Society, the Society he jointly founded and whose 200th anniversary we celebrate this year.